Examination Nov/Dec 2019

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-444
FACULTY OF SCINECE AND TECHNOLOGY
S.E. (EEP/EE) (Sem-I)
Electrical Engineering Materials
[OLD]

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

Please check whether you have got the right question paper.

N.B
1. Q .no.1 and Q.no.6 are compulsory
2. Attempt any two questions from remaining questions in each section.

Section -A

Q.1   Attempt any five from following   10
a) Define   i) Dielectric constant   ii)Tan θ
b) Define ionic polarization
c) List out optical properties of materials used for power generation.
d) Define photo conductivity
e) Define magnetization
f) List out four magnetic recording materials
g) Define i) Dipole moment   ii) secondary Ionization

Q.2   a) Distinguish between pyro-electric and furo-electric materials give example of each   07
b) Describe the material used, construction equivalent circuit , working & application of   08
photovoltaic cells

Q.3   a) What are the methods of classification of insulating materials? Which method is mostly   08
adopted in market.
b) What are the criteria for selection of insulating materials used for cables? Explain with   07
neat sketch.

Q.4   a) Describe the terms permeability magnetic susceptibility.   08
b) Explain the method of partial discharge measurement in HV cables   07

Q.5   Write short notes on any three   15
a) P.V. cells
b) Sf$_6$ insulator & its uses
c) Primary Ionization in gases
d) Magnetic recording material
e) Compact discs

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Section – B

Q.6   Attempt any five from following   10
   a) Properties of electrical conducting materials
   b) List out properties of thermal conducting materials
   c) Define energy bands
   d) Define i) soft magnetic material   ii) Hard magnetic material
   e) List out any   five material properties for transmission live conductor
   f) What is meant by 'Nano' in nano structures?
   g) Write any four properties of 'fuse' element material.

Q.7   a) Explain the concept of energy bands in details   07
       b) Explain in short various conducting mechanism in nano- structures.   08

Q.8   a) How will you measure flux density by "Gauss meter" in your Lab?   07
       b) Explain the required properties of a metal required for 'Lamp filament'. 08

Q.9   a) Discuss the working of i)Thermal Bimetal ii) thermo couple   08
       b) Explain about the use of magnetic material in compact discs.   07

Q.10   Write short notes on any three   15
   a) Single electron transistor
   b) Molecular machines
   c) Materials used for transmission lives
   d) Materials used for fuses
   e) Carbon nano tubes
   f) Carbon nano structures

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1037
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem IV)
AC Machine
[OLD]

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

Please check whether you have got the right question paper.

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

Section "A"

Q.1   Attempt any five of the following: 10

a. Enlist different parts of Induction motor with material used.
b. Differentiate between transformer and induction machine.
c. State the procedure to reverse the direction of rotation of single phase induction motor.
d. State the principle of induction motor.
e. What is meant by single phasing.
f. What are the advantages of wound rotor?
g. Give the classification of single phase induction motor

Q.2   a) Explain the production of rotating magnetic field for three phase supply.   08
        b) Explain the pole formation strategy in induction motor.   07

Q.3   a) Explain DOL, starter with neat sketch.   08
        b) A properly shunted centre zero galvanometer is connected in the rotor circuit of a 6 pole   07
           50 hz wound rotor induction motor. If the galvanometer makes 90 complete oscillations in
           one minute. Calculate speed.

Q.4   a) Derive the expression for starting and running torque of 3-phase induction motor.   08
        b) Find the mechanical power output at a slip of 0.05 of the 185W, 4-pole, 110V, 60Hz single   07
           phase induction motor, whose constants are given below: (1) Resistance of the stator main
           winding R_1=1.86Ω, (2) Reactance of the stator main winding X_1=2.56Ω, (3) Magnetizing
           reactance of the stator main winding Xm=53.5Ω. (4)Rotor resistance at standstill R_2 =
           3.56Ω, (5) Rotor reactance at standstill X_2 = 2.56Ω.
           Derive the equation for torque under running condition.

Q.5   a) Explain double field revolving theory.   08
        b) Draw and explain torque slip characteristics of three phase induction motor.   07

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H-1037

Section "B"

Q.6   Attempt any five of the following: 10
      a. Define coil span in synchronous motor.
      b. What are the causes for hunting in synchronous motor.
      c. What is the importance of excitation in synchronous machines?
      d. Draw the equivalent circuit of a synchronous alternator.
      e. Draw the phasor diagram of synchronous motor for under excitation.
      f. What is armature reaction in alternator?
      g. State the formula and importance of distribution factor.

Q.7   a) With the help of vector diagram explain the effect of different excitation on to performance   08
        of synchronous motor.
      b) Define voltage regulation of alternator. Explain its significance   07

Q.8   a) A 3 phase, star connected synchronous generator running at 750 rpm generates a line to line 08
        voltage of 440 V at 50 Hz on open circuit. The stator is wound with 2 slots per pole per
        phase and each coil has 4 turns. Assume full pitch coil. What is the useful flux per pole.
      b) Explain the armature reaction in synchronous machines.   07

Q.9   a) A 3 phase star connected synchronous generator is rated at 15 KVA, 415V. The armature   08
        effective resistance are 0.5 Ohm respectively. What is the per phase percentage voltage
        regulation for a load at 10 KVA at 0.8 lag power factor.
      b) Explain any two methods used to make synchronous motor self-starting.   07

Q.10   a) Explain the synchronous motor on constant load with changing excitation.   08
      b) Explain characteristics of alternator.   07

Total No. of Printed Pages:03

SUBJECT CODE NO:- H-1038
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (Electrical) (Sem-IV)
Network Analysis
Rev.CBC & Grading.

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

Please check whether you have got the right question paper.

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

Section A

Q.1   Attempt any five of the following: 10

      a) Sate KCL.
      b) Define active and passive network
      c) What do you mean by resonance?
      d) Define Tree and Co – tree
      e) Define Twig and Links
      f) Write the Laplace transform of Unit Step and Unit Ramp function.
      g) Define time constant in RC Circuit.

Q.2   a) Determine the values of V_1 and V_2 in following circuit by nodal analysis.   07
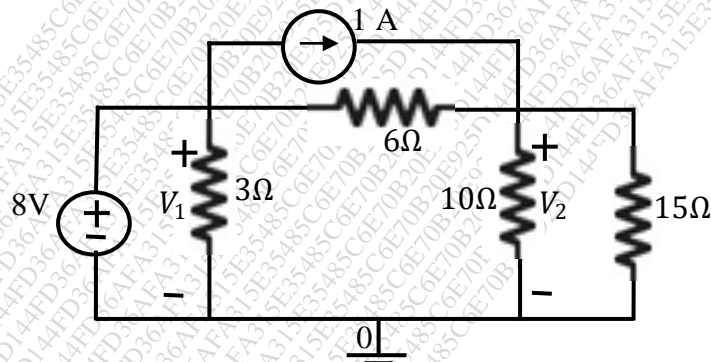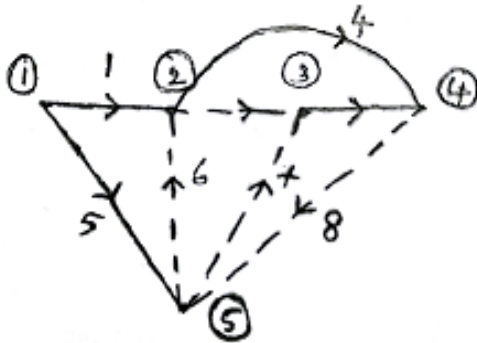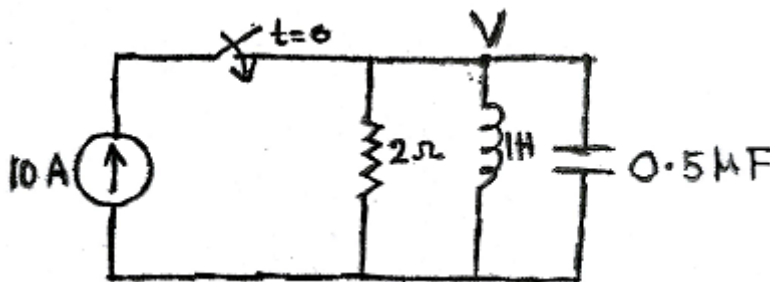

   b) Explain the resonance in RLC series circuit and define quality factor.   08

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Q.3   a) Obtain Fundamental Cut – set matrix and fundamental tie – set matrix for following graph.   08

       b) Draw the dual of the following network.   07

Q.4   a) Derive the expression for transient response of current in RL series circuit if switch is closed 08
           at t =0. Assume zero initial conditions. Use Laplace transform.

       b) In following circuit switch is closed at t = 0 with zero initial conditions. Determine   07
           $i(t), \frac{di(t)}{dt}$ and $\frac{d^2 i(t)}{dt^2}$ at t = 0+.
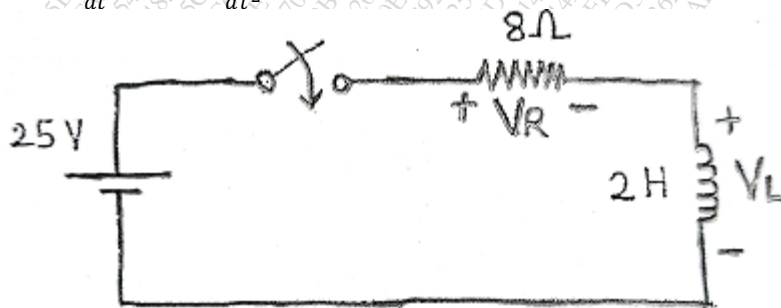
Q.5   Write a short note: (any three)   15

   a) Telgellen's Theorem
       b) Filter used for Band rejects
       c) Initial conditions for R, L & C.
       d) Fundamental Cut – set and fundamental Cut – set Matrix.

Section B

Q.6   Solve any FIVE from following.   10

a) Why Z – parameters are called as open circuit impedance (Z) parameter
b) Define driving point impedance at port 1 with port 2 open
c) Give any 2 condition for a function to be positive real.
d) Define Hurwitz polynomial.
e) What does a pole at infinity indicate?
f) Test whether the polynomial $P(S) = S3 + 4S2 + 5S + 2$ is Hurwitz.
g) Write the Z – parameters of the following network
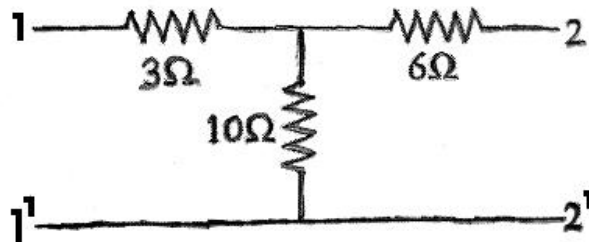
Q.7   a) Find the transmission parameter for the network shown.   07
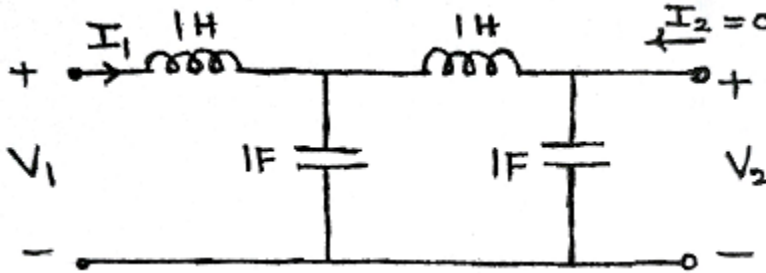
b) Derive the inter – relationship between   08
   i.   Z and Y parameters
   ii.   Z and ABCD parameters

Q.8   a) Test whether the following function in positive real. $Z(s) = \frac{s^2+2s+15}{s+5}$.   07

b) Explain the conditions for reciprocity and symmetry of the circuit in terms of parameters.   08

Q.9   a) Realize the foster form of following RC circuit impedance function $z(s) = \frac{(s+2)(s+4)}{(s+1)(s+3)}$.   08

b) Find the Cauer form of the following R1 circuit impedance function $z(s) = \frac{2(s+1)(s+4)}{(s+2)(s+3)}$.   07

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Q.10   Write short Note on (any three)   15

        h) Significance of poles and Zeros.
        i) Transformed impedance
        j) Hurwitz polynomials
        k) Canonical (standard) forms of L –C NETWORK?

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H_1062
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem IV)
Electrical Measurement
[OLD]

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

Please check whether you have got the right question paper.

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

Section A

Q.1   Answer any five of the following: 10
a) Define Static Characteristics of instruments.
b) Why Calibration is important.
c) When should we calibrate an instrument?
d) What is a standard and name the main 4 standards?
e) Write the classification of instruments.
f) Draw a neat diagram of a PMMC instrument and mark its parts.
g) Explain Controlling & Deflecting torque.

Q.2   a) Explain the following terms- Accuracy, Precision, Drift, Resolution, Reproducibility, Dead   07
zone, Resolution.

b) Explain MI Instruments with neat diagrams.   08

Q.3   a) Derive the torque equation of PMMC Instruments.   07

b) A PMMC instrument has a coil of dimension $15mm \times 12mm$. The flux density in the air   08
gap is 1.8*10-3 Wb/m^2 and the spring constant is 0.14*10-6Nm/rad. Determine the number
of turns required to produce an angular deflection of 900 when a current of 5mA is flowing
through the coil.

Q.4   a) A PMMC voltmeter with a resistance of 20Ω gives a full scale deflection of 120° when a   08
potential difference of 100 mV is applied across it. The moving coil has dimensions of
$30\ mm \times 25\ mm$ and is wound with 100 turns. The control spring constant is $0.375 \times 10 -$
$6\ N - m$/degree. Find the flux density in the air gap. Find also the dimension of copper wire
of coil winding if 30% of the instrument resistance is due to coil winding. The specific
resistance of copper is $1.7 \times 10 - 8\ \Omega m$.

b) Explain Universal shunt with diagram.   07

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Q.5   a) Explain the block diagram of Generalized Instrumentation System.   08
       b) Explain Kelvin's Double Bridge with all the equations.   07

Section B

Q.6   Answer any five of the following: 10
       a) Draw the circuit of CT & PT and mark the parts.
       b) What do you mean by Lissajeous Patterns?
       c) Define Burden of an instrument transformer.
       d) Explain phase angle error.
       e) List out the classification of Resistances along with their ranges.
       f) Why Kelvins Double Bridge is known as a Double Bridge?
       g) Find fy/fx from the given figure.
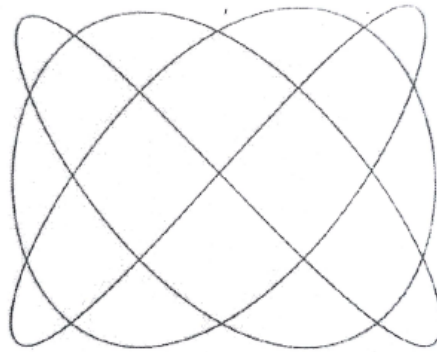
Q.7   a) Derive the General equation for bridge balance of an AC Bridge.   08
       b) Explain Ammeter voltmeter method of measurement of low resistance.   07

Q.8   a) Explain Maxwell's Inductance Bridge with all the relevant equations.   08
       b) Explain the difference between the analog and digital instruments.   07

Q.9   a) Explain Megger with neat diagram.   08
       b) Draw & explain the construction & working of single phase Energymeter.   07

Q.10   a) Explain CRO and its types with a neat diagram.   08
       b) How Extension of range in voltmeter can be achieved?   07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1063
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (Electrical) CBC & Grading System (Sem IV)
AC Machine
[Revised]

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

Please check whether you have got the right question paper.
N.B
   1) Question no.1 from Section A and Question no.6 from Section B is compulsory
   2) Solve any two from remaining questions from each section
   3) Assume suitable data, if required

Section A

Q.1   Attempt any five of the following   10
   a) Why squirrel cage induction motor used in maximum industrial applications?
   b) Why induction motor called rotating transformer?
   c) What is the purpose of block rotor test?
   d) State the faradays first, second and third law
   e) What is meant by single phasing
   f) What are the advantages of skewing?
   g) Give the classification of single phase induction motor

Q.2   a) Compare single phase and three phase induction motor   08
      b) Explain the pole formation strategy in induction motor   07

Q.3   a) Explain Auto-transformer starter with neat sketch   08
      b) A properly shunted centre zero galvanometer is connected in the rotor circuit of a 10 pole 50hz 07
         wound rotor induction motor. If the galvanometer makes 90 complete oscillations in one
         minute, calculate speed

Q.4   a) Explain the construction and working of shaded pole induction motor   08
      b) Explain torque slip characteristics of three phase induction motor   07

Q.5   a) Explain double field revolving theory   08
      b) Draw and explain torque slip characteristics of single phase induction motor   07

Section B

Q.6   Attempt any five of the following   10
   a) Define short circuit ratio in synchronous motor
   b) What are the causes for hunting in synchronous motor
   c) What is the importance of excitation in synchronous machines?
   d) Draw the equivalent circuit of a synchronous motor
   e) Draw the phasor diagram of synchronous motor for over excitation
   f) What are the necessary conditions for parallel operation of alternator?
   g) State the formula and importance of pitch factor

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H-1063

Q.7	a)	In details explain the role of damper winding in machines	08
	b)	Explain the power flow diagram of synchronous motor with neat diagram	07
Q.8	a)	Explain the operating characteristics of alternator	08
	b)	Explain the armature reaction in synchronous machines	07
Q.9	a)	What are the effect of changes on a synchronous motor	08
	b)	Explain any two methods used to make synchronous motor self-starting	07
Q.10	a)	Compare synchronous motor and induction motor	08
	b)	Explain V-curves of synchronous motor	07

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Total No. of Printed Pages:05

SUBJECT CODE NO:- H-1088
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem IV)
Network Analysis
[OLD]

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

Please check whether you have got the right question paper.

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

Section A

Q.1   Attempt any five of the following: 10

   a) Explain the concept of duality applied to network topology.
   b) Explain incidence matrix.
   c) Mention the importance of superposition theorem in network analysis.
   d) Define a filter. What are its applications?
   e) What are the advantages of the phenomenon of resonance?
   f) Define 1) oriented graph   2) link
   g) Define Ideal and practical sources.

Q.2   a) Find the maximum power delivered to the load R_L in the circuit shown in Fig.1.   08
            b) Under what conditions do you consider topology for network analysis? For the   07
               graph shown in Fig.2, for a co-tree (4,5,7,8) write tie-set and cut-set matrix.

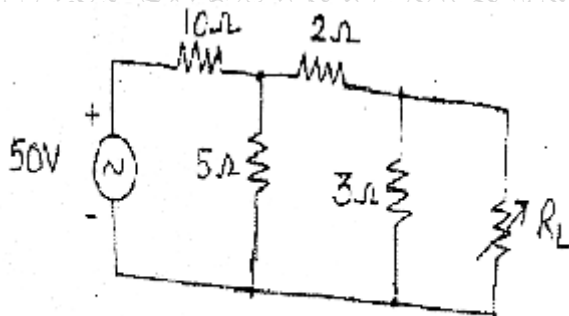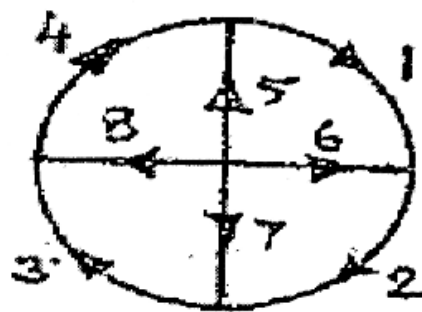Fig. 1.   Fig. 2.

Q.3   a) State and explain reciprocity theorem. What is transfer impedance?   08
            b) In the network shown in Fig.3, the switch K is closed at t=0. Find   07

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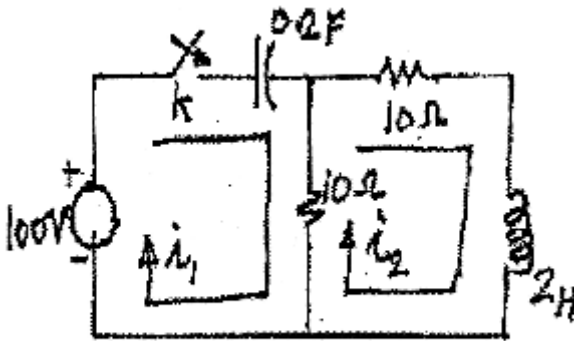1) i_1 2) i_2 3) di_1/dt 4) di_2/dt at $t=0^+$ for zero initial conditions.

Fig. 3.

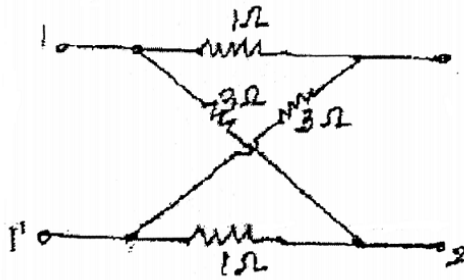Q.4   a) Find the Z-parameters of the two port network shown in Fig.4.   08

Fig. 4.

b) For a series resonant circuit show that $f_r = \sqrt{(f_1 f_2)}$ where f_r is resonant   07
frequency and f_1, f_2 half power or cut-off frequencies.

Q.5   a) Obtain Norton's equivalent circuit for the figure shown in Fig.5. Also calculate   08
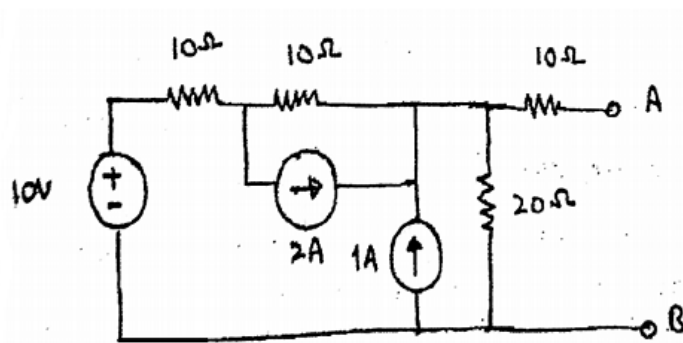power dissipation in 20 Ω resistor across terminals A and B.

Fig. 5.

b) In a parallel resonant circuit R, L and C are in parallel. Half power frequencies 07
are 103 rad/s and 108 rad/s respectively. The magnitude of impedance at 105 rad/s
is 10Ω . Find R,L and C.

Section B

Q.6   Solve any FIVE from following: 10

1) Explain with neat sketch variation of suspectance in a parallel resonant circuit.
2) Define Y parameter.
3) Define linearity of a system.
4) Define network and graph.
5) Distinguish between driving point impedance and transfer impedance.
6) Define following with examples: i) Steady state   ii) Transient state
7) Define H parameter.

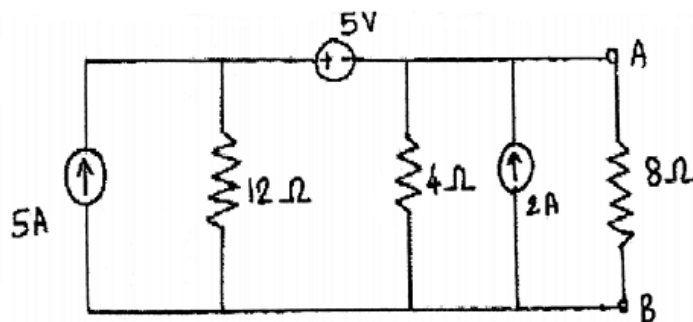Q.7   a) Find current through 8Ω resistance by Norton's theorem.(Refer Fig.6.)   07

Fig. 6

b) Using superposition theorem, find current through load resistance $R_L = 10\Omega$ for 08
the circuit shown in Fig.7.

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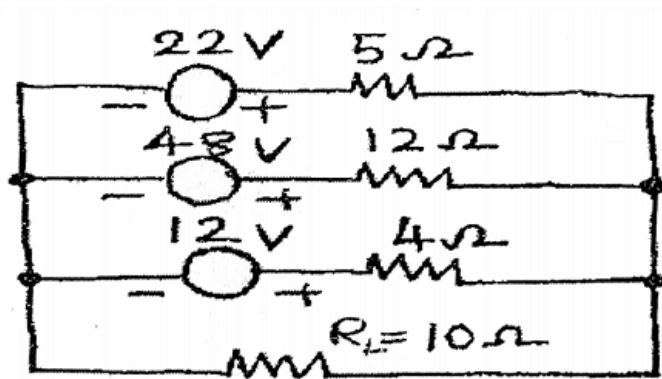
Fig. 7

Q.8   a) In the network shown in Fig.8, the switch is moved from position a to b at t=0, the 07
Steady state having reached before switching i) i   ii) di/dt   iii) $d^2 i/dt^2$ at t=0⁺
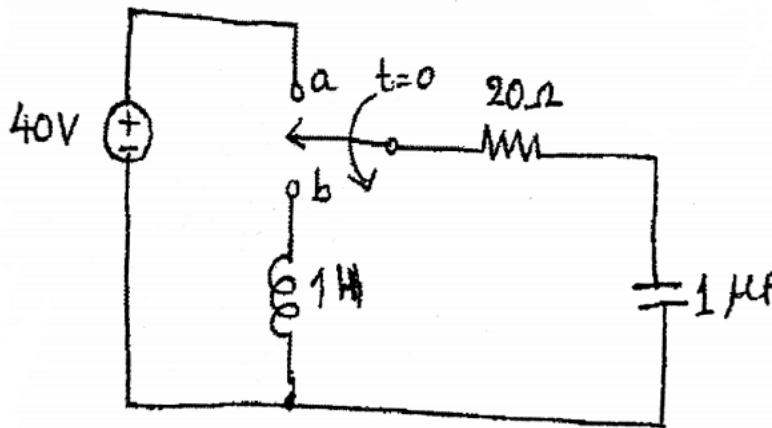

Fig. 8.

b) Write a short note on location of Pole-zeros and time domain response.   04

c) A two-port network has following Z-parameters: $Z_{11}=10\Omega$, $Z_{22}=12\Omega$ and
$Z_{12}= Z_{21}=5 \ \Omega$. Compute Y-parameters of the same network.   04

Q.9   a) For a two port network shown in Fig.9, find driving point impedance function and 08
voltage ratio transfer function.
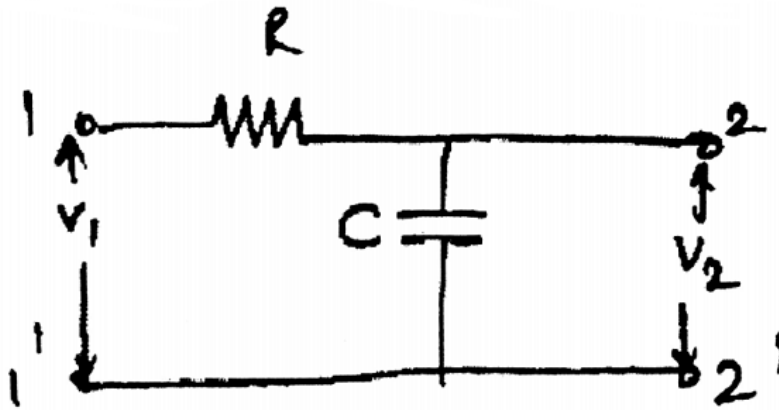
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Fig. 9.

07

b) Obtain ABCD parameters in terms of impedance parameters and hence show AD-BC=1.

Q.10   Attempt any three.   15

a) A coil of inductance 0.2 H and resistance 5Ω is connected in series with a capacitor of $0.05\ \mu F$. Find frequency of series resonance in Hz.
b) A parallel resonant circuit is "current amplifier" justify.
c) What are non-linear elements? Give some examples.
d) A series resonant circuit is "voltage amplifier" justify.
e) Explain twigs and links.

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1089
FACULTY OF SCIENCE AND TECHNOLOGY
S Y B.Tech. (Electrical) CBC & Grading System (Sem IV)
Analog and Digital Circuits
[Revised]

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

Please check whether you have got the right question paper.
N.B   1) Question no1 from section A and Question no. 6 from section B is compulsory.
          2) Solve any two from remaining questions from each section.
          3) Assume suitable data, if required.

SECTION – A

Q.1   Attempt any five from the following: 10
        a) Differentiate Oscillator and amplifier.
        b) State applications of Monostable Multivibrator.
        c) Define Turn on and Turn off time of transistor.
        d) What is dark current of Photodiode?
        e) Give classification of the oscillators.
        f) Give the classification of IC based voltage regulators
        g) Draw pin diagram of IC555.

Q.2   a) Determine the transition capacitance of a diffused junction Varactor diode at a reverse bias   08
           voltage of 4.2 V if C (0)=80pF and junction potential of 0.7 V. Also calculate constant K for
           a diode.
        b) What is BJT? How can it be acts as a switch?   07

Q.3   a) Explain with neat sketch, the working of IC555 as anmonostableMultivibrator.   08
        b) What is Oscillator? Explain RC phase shift oscillator.   07

Q.4   a) What is schottky diode? Why it is called as hot carrier diode? Give any two applications.   08
        b) Define Duty cycle. Derive the expression for the duty cycle of an astableMultivibrator using   07
           IC555.

Q.5   a) What is MonostableMultivibrator? Explain.   08
        b) Give Classification of voltage regulators and explain Adjustable voltage regulator using   07
           LM317.

SECTION – B

Q.6   Attempt any five from the following: 10
        a) What is Boolean algebra?
        b) Give excitation table of JK flipflop
        c) Convert binary 1001 into gray.
        d) What is Race Around Condition in JK FF?

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e) Draw the structure of three variable K – map?
f) Why NAND and NOR gates are called as universal gates?
g) State the laws of Boolean Algebra.

Q.7   a) Simplify the expression given below   05
$$Y = AB + (A + B)(A' + B')$$
b) Minimize the following expression using K- map   10
$$Y = \sum m(1,4,8,12,13,15) + d(3,14)$$

Q.8   a) Implement the following expression using 8:1 multiplexer   08
$$Y(A, B, C, D) = \sum m(0,1,2,5,7,8,9,14,15)$$
b) Compare Combinational and sequential circuits   07

Q.9   a) Design 4 bit ring counter using D flip flops ion?   08
b) What is Master Slave JK Flip flop? How will it overcome RACE AROUND condition?   07

Q.10   a) What is Race around condition in JK flip-flop? Explain Master Slave JK flip flop.   08
b) Convert SR flip flop into JK flip flop.   07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1145
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) CBC & Grading System (Sem IV)
Elective-I Electrical Engineering Materials
[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 from remaining questions from each section.
      iii) Assume suitable data, if required.

Section A

Q.1   Solve any five from the following.   10
    a) Define electric dipole moment.
    b) Draw an equivalent circuit of PV cell.
    c) List the good solid insulating materials.
    d) Define breakdown voltage.
    e) Define magnetic susceptibility.
    f) List insulating materials used for power cables.

Q.2   a) Define the term polarization. Explain ionic polarization with neat diagram.   08
    b) Explain loss tangent and its significance.   07

Q.3   a) Explain photoelectric emission with neat diagram.   07
    b) Explain various factors that affect breakdown in gaseous insulating materials.   08

Q.4   a) Draw hysteresis loop for ferromagnetic materials and explain Coercive force and residual   08
     magnetism.
    b) Differentiate between Soft and Hard Magnetic Materials.   07

Q.5   Write short notes. (any three)   15
    a) Materials used for PV Cell
    b) Insulating materials used for power transformer
    c) Ferromagnetism
    d) Permeability and magnetic susceptibility

Section B

Q.6   Solve any five from the following.   10
    a) What are the properties of good conducting material?
    b) Which material is used for solders? Give its properties.
    c) Define energy bands.
    d) List the applications of BN Nanotubes.
    e) IS 6798 is used for what purpose.
    f) Which materials are used for Lamp filament?

1

H-1145

Q.7	a) Name the materials used for following applications with reason.
	    i) Lamp filament
	    ii) Heating Electrodes
		08

	b) What are thermocouples? List their applications.	07
Q.8	a) Explain Carbon Nano tube and its applications.	08
	b) What do you mean by Single electron transistor and Molecular machine?	07
Q.9	a) Explain in detail the method to measure the loss tangent of transformer oil.	08
	b) Explain a method to test high voltage bushing of distribution transformer.	07

Q.10	Write short notes. (any three)
	    a) Copper alloys
	    b) Molecular machine
	    c) IS 2584
	    d) Single Electron Transistor
		15

Total No. of Printed Pages:02
SUBJECT CODE NO:- H-1171
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (Electrical) (Sem-IV)
Data Structure
[Old]

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

Please check whether you have got the right question paper.
N.B
1. Question no. 1 and 6 are compulsory.
2. Attempt any two questions from remaining questions from each section.

Section A

Q.1	Attempt any THREE:	06
	a. Define merge sort.	
	b. Differentiate Data and information.	
	c. What is array?	
	d. Define data structure.	
	e. Define Linear Data Structure.	

Q.2   a. Sort the sequence 3, 1, 4,1,5,9,2,6,5 using Bubble sort.   04
        b. Explain the operation and implementation of Selection sort.   03

Q.3   a. Explain working of an Array with example.   04
        b. Compare different Sorting algorithms.   03

Q.4   a. Explain Abstract Data Type.   04
        b. Write a short note on Primitive and non – primitive data structures. 03

Q.5   a. Write a program to implement bubble sort.   04
        b. What is Pointer Variable? Explain with example.   03

Section B

Q.6	Attempt any THREE:	06
	a. Define binary tree?	
	b. What is Queue? Explain by comparing with stack.	
	c. What is single linked list?	
	d. What are the initial values of top, front, rear?	
	e. Define Degree of a tree.	

Q.7   a. What is Graph? Explain with example.   04
        b. Explain concept of Linear Data Structure.   03

Q.8   a. Describe Binary Search Tree with Example.   04
        b. Write short note on different types of linked lists.   03

1

Q.9	a.	Write a program to implement Stack using array.	04
	b.	Make a binary search tree for the following sequence of numbers: 45, 36, 76, 23, 89,115, 98, 39, 41, 56, 69, 48	03
Q.10	a.	Write a routine to insert an element in a linked list.	04
	b.	Explain working of Queue with example.	03

Total No. of Printed Pages:02
SUBJECT CODE NO:- H-1172
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (Electrical) CBC & Grading System (Sem-IV)
Signals and Systems
[Revised]

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

Please check whether you have got the right question paper.
N.B   1. Q.1 & 5 are compulsory.
                             2. Attempt any two questions from Q.2 to Q.4 & Q.6 to Q.8.
                             3. Assume suitable data if required.

Section A

Q.1   Attempt any three of the following   06

         i)   Define Impulse signal.
         ii)   Classify of Elementary signal.
         iii)   Recall the equation for Fourier series representation?
         iv)   Solve the Laplace transform for x(t) = u(-t).

Q.2   Explain the properties of following systems:
         1. Stable unstable,   03
         2. Invertible and Non Invertible   02
         3. Time variant and Time Invariant   02

Q.3   Solve the integro differential equation by using Inverse Laplace transform.   07
       $$\frac{dy(t)}{dy} + 2y(t) + 5 \int_0^t y(t)dt = e^{-2t}$$

Q.4   Find the inverse Laplace transform   07
         a) $X(s) = \frac{1}{(S+1)^2}$
         b) $X(s) = \frac{1}{(S+1)^2+1}$
         c) $X(s) = \frac{1}{(S+2)^2}$

Section B

Q.5   Attempt any three of the following   06

         i)   What is the equation for discrete Fourier series representation?
         ii)   Write advantages of Z – transform
         iii)   What is State variables?
         iv)   Compare Continuous time Fourier series and Discrete time Fourier series?

Q.6   Find the coefficient value Ck of Discrete Fourier series representation.   07

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Q.7

a) Find the inverse Z- transform for $X(Z) = \dfrac{\frac{1}{4}Z^{-1}}{\left[1-\left(\frac{1}{2}\right)Z^{-1}\right]\left[1-\left(\frac{1}{4}\right)Z^{-1}\right]}$ 07
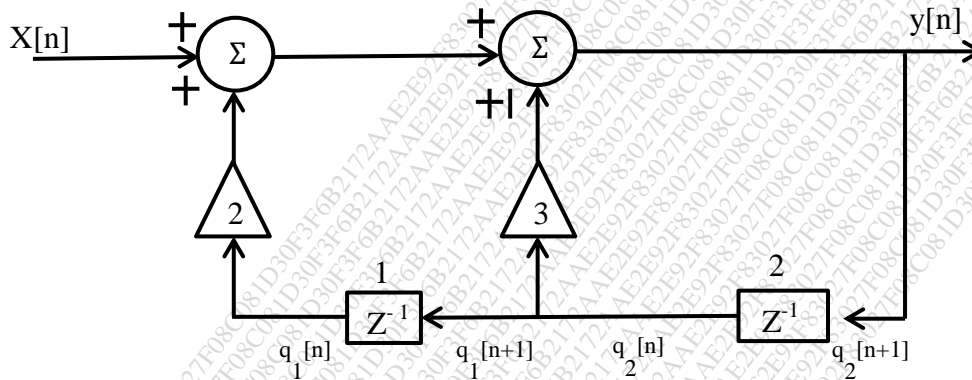
    a. $ROC|z| > \dfrac{1}{2}$

    b. $ROC|z| < \dfrac{1}{4}$

    c. $ROC\,\dfrac{1}{4} < |z| < \dfrac{1}{2}$

Q.8   Consider the discrete – time LTI systems shown in figure. Find State Space representation of the   07
system by choosing the outputs of unit – delay elements 1 and 2 as state variables $q_1[n]$ and $q_2[n]$
respectively.

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1217
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem-III)
DC Machine & Transformers
[OLD]

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

Please check whether you have got the right question paper.
N.B   1) Q.No.1 from section A and Q.No.6 from section B is compulsory.
          2) Solve any two from remaining questions from each section.
          3) Assume suitable data, if required.

Section A

Q.1	Answer any five of the following:	10
	a) Write the function of Pole shoe in DC machine with neat sketch	
	b) What is critical resistance on DC Generator	
	c) Draw the power stage diagram for DC Generator	
	d) DC Shunt motors are constant speed motors. Why?	
	e) Define armature reaction?	
	f) What are the essential parts of an energy conversion system?	
	g) Why DC series motors used to start on heavy loads	

Q.2	a) Explain the functions of the parts of DC Generator with neat sketch.	08
	b) Explain the electromechanical energy conversion principle with block diagram.	07

Q.3	a) What is Armature reaction & explain its effects.	08
	b) A 8 pole generator supplies a current of 250A it has 750 lap winding armature conductors. When delivering full load the brushes are given an lead of 12^0 calculate the AT_d\pole and AT_c\pole.	07

Q.4	a) Explain the different braking methods of DC motor.	07
	b) A 12 pole lap connected 230V shunt motor has 410 armature conductors. It takes 41 A on full load flux per pole 0.05wb, the armature & field resistances are 0.1ohm & 230ohm respectively. The brush contact drop is 1V. Determine speed of motor at full load.	08

Q.5	Write short notes on any three	15
	a) Speed control of DC shunt motors	
	b) Voltage build up in a self-excited generator	
	c) Commutation	
	d) Interpoles	

Section B

Q.6   Answer any five of the following: 10
  a) Why the transformer is placed in oil filled tanks?
  b) Define all day efficiency of transformer
  c) Define voltage regulation of transformer
  d) Draw the circuit for permanent magnet stepper motor
  e) List the applications of servo motor
  f) Define transformation ratio
  g) Why the transformer core is laminated?

Q.7   a) Draw the equivalent circuit of transformer and describe the various parameters involved in   07
         it.

       b) Explain the open and short circuit tests of transformer.   08

Q.8   a) Explain the principle and working of autotransformer.   07

       b) A single phase transformer has 500 primary & 1000 turns of secondary winding the   08
          emf/turns is 0.2V. calculate
          a) EMF induced in the primary & secondary windings
          b) The area of core for the max flux density 0.045wb.

Q.9   a) Derive an emf equation of transformer.   07

       b) The maximum flux density in the core of 250/3000V, 50Hz single phase transformer is   08
          $1.2wb/m^2$. If the emf/turns is 8V. determine
          a) Primary & secondary turns
          b) Area of core

Q.10   a) Explain the construction and working of permanent magnet stepper motor.   07
       b) Explain the principle of operation of servomotors. Explain any one   08

Total No. of Printed Pages:2

SUBJECT CODE NO:- H_1218
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem III)
DC Machine & Transformers
[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 remaining questions from each section.
3) Assume suitable data, if required.

Section A

Q.1 Attempt any five of the following: 10
   a) State the function, material used, and advantages of brushed of dc machines.
   b) In brief explain about armature winding of dc machine.
   c) Explain the function of interpoles.

   d) A dc shunt generator running at 1000 rpm with critical resistance of 80 Ohm. Its shunt resistance is 50 Ohm then calculate critical speed.

   e) What is commutation?

   f) A 4 pole dc machines has total turns 100, and emf per turns is 10. Then show lap and wave winding in the form of circuits.

   g) What is armature reaction?

Q.2 a) Explain characteristics of dc shunt motor. 08
   b) Derive an emf equation of dc machine. 07

Q.3 a) Explain plugging mode of dc motor. 08

   b) A lap wound dc shunt generator having 80 slots with 10 conductors per slot generates at no 07
   load an emf 400 V when running at 1000 rpm. At what speed should it be rotated to generate a voltage of 220 V on open circuit?

Q.4 a) Explain the process of communication in dc machines and describe the methods to improve 08
   it.

   b) An 8 pole generator has 500 conductors and has a useful flux per pole of 0.065 Wb. What 07
   will be the emf generated if it is lap connected and runs at 1000 rpm? What must be the speed at which it is to be driven to produce the same emf if it is wave wound?

1

Q.5   a)   Distinguish between self-excited and separately dc generators. How are self-excited dc   08
generators classified? Give there circuit diagram.

        b)   What are various possible causes for dc shunt generator not building up voltage?   07

Section B

Q.6   Attempt any five of the following: 10
        a)   Differentiate between three phase bank transformer and single unit transformer?
        b)   What is magnetic inrush current?
        c)   Describe the importance of laminations in transformer?
        d)   Draw the voltage regulation curve of transformer and label it.
        e)   Draw the magnetization curve for different materials that can be used a core of transformer.
        f)   Write the applications of synchros.
        g)   State the principle of hybrid motor.

Q.7   a)   Draw and explain phasor diagram of transformer on load with equivalent circuit.   08
        b)   Distinguish between core type and shell type transformer.   07

Q.8   a)   Derive the emf equation of transformer.   08
        b)   Explain about stepper motor characteristics and step angle.   07

Q.9   a)   Explain the construction and working of three phase transformers with advantages and   08
applications.

        b)   A 50Hz single phase transformer draws a short circuit current of 35A at 0.25 pf lag, when   07
connected to 16V, 50 Hz source. What will be the pf if it is energized from 16V, 75 Hz
source?

Q.10   a)   Explain about the ratings of transformer. What are the performance indices of transformer?   08
        b)   Derive the condition for maximum efficiency of transformer.   07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1251
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (Electrical) (Sem-III)
Power Plant Engineering
[Old]

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

Please check whether you have got the right question paper.

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

Section A

Q.1 Answer any five of the following: 10
    a) Explain Spillway and its use.
    b) Explain Economiser and its use.
    c) Write the function of valve house & trashrack.
    d) Draw and explain solar power plant.
    e) Draw a neat diagram of pumped storage power plant and label its parts.
    f) Explain Rankine cycle.
    g) Write about Live & Dead Storages.

Q.2 A) Explain with diagram the function of air preheater, superheater, cooling tower, 08
       alternator, steam turbine and draught system in a thermal power plant.
    B) Explain the site selection of Thermal Power Plant. 07

Q.3 A) Explain the working of hydro power plant with neat diagram. 08
    B) Explain different types of hydro power plants system with neat diagrams. 07

Q.4 A) What is a turbine? Explain the different types of turbines. 08
    B) Explain the different parts of a hydro power plant. 07

Q.5 A) A hydro-electric generating station is supplied from a reservoir of capacity 11×10^6 08
       cubic metres at a head of 443 metres. Find the total energy available in kWh if the
       overall efficiency is 79%.
    B) Explain pumped storage hydro power plant. 07

Section B

Q.6 Answer any five of the following: 10
    a) Explain Nuclear reaction.
    b) List out examples for nuclear fuel, coolant, control rods & moderators.
    c) Define average load & load duration curves.
    d) Define diversity factor & Plant factor.
    e) What do you mean by Base load power plants?
    f) Explain types of nuclear wastes.
    g) List out the peak load power plants.

Q.7	A) Explain Chain reaction with relevant chemical reactions and diagram.	08
	B) List the criteria for site selection of nuclear power plant.	07
Q.8	A) Explain working of diesel power plant with the help of neat diagram.	08
	B) Explain working of Closed loop gas power plant.	07
Q.9	A) Explain the working of Combined heat and power plant.	08
	B) List the criteria for site selection of Diesel power plant.	07
Q.10	A) Explain Tariff and its various types in detail.	08
	B) Explain the advantages of gas power plant.	07

Total No. of Printed Pages:02
SUBJECT CODE NO:- H-1252
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y. B.Tech. (Electrical) (Sem-III)
Electrical Measurements
[Revised]

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

Please check whether you have got the right question paper.
N.B   1) Question no 1 from section A and Question no 6 from Section B is
                             compulsory.
                             2) Solve any two from remaining questions from each Section.
                             3) Assume suitable data, if required.
Section A

Q.1   Answer any five of the following: 10
         a) Define Dynamic Characteristics of Instruments.
         b) Define accuracy and dead zone.
         c) When should we calibrate an instrument?
         d) What do you mean byerror?
         e) What do you mean by Resolution of an instrument?
         f) List out the examples of indicating, integrating & recording instruments.
         g) Explain Primary standards.

Q.2   A) Explain the classification of torques acting on an instruments in detail.   07
         B) Explain MI Instruments with neat diagram.   08

Q.3   A) Derive the torque equation of PMMC Instrument.   07
         B) A PMMC voltmeter with a resistance of 50 Ω gives a full scale deflection of 120° when   08
            a potential difference of 105 mV is applied across it. The moving coil has dimensions
            of $32mm \times 24mm$ and is wound with 120 turns. The control spring constant is
            $0.375 \times 10^{-6} N - m/degree$. Find the flux density in the air gap. Find also the
            dimension of copper wire of coil winding if 28% of the instrument resistance is due to
            coil winding. The specific resistance of copper is $1.7 \times 10^{-8} \Omega m$.

Q.4   A) Derive the torque equation for MI Instruments.   08
         B) Explain Universal Shunt with diagram.   07

Q.5   A) Explain the block diagram of Generalized Instrumentation System.   08
         B) Explain Maxwell's inductance capacitance bridge with all the equations.   07

Section B

Q.6   Answer any five of the following: 10
- a) Draw the circuit of Shearing Bridge.
- b) What do you mean by creeping?
- c) Define turns ratio of an instrument transformer.
- d) Name the devices used to measure Insulation resistance. Earth resistance & Low resistances.
- e) List out the classification of Resistances along with their ranges.
- f) What is the significance of the second set of arms in Kelvins Double Bridge?
- g) List out the Sources & Detectors used in AC Bridges.

Q.7   A) Derive the General equation for bridge balance of an AC Bridge.   08
        B) Explain Drift and its types with all the necessary graphs.   07

Q.8   A) Explain Maxwell's Inductance Capacitance Bridge with relevant equations.   08
        B) Explain Megger with neat diagram.   07

Q.9   A) Explain the difference between the CT and PT.   07
        B) Draw & explain the construction & working of digital voltmeter.   08

Q.10   A) Explain power measurement in three phase system.   08
        B) How Extension of range in ammeter can be achieved?   07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1286
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem-III)
Electronic Devices & Circuits
[OLD]

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

Please check whether you have got the right question paper.
N.B   1. Q.No.1 from section A and Q.No.6 from section B is compulsory.
       2. Solve any two from remaining questions from each section.
       3. Assume suitable data, if required.

Section A

Q.1   Attempt any five from the following: 10
       a) What is base width modulation?
       b) Define voltage regulator?
       c) State the operating region of transistor?
       d) What is PIV?
       e) What do you mean by filters?
       f) What is stability factor?
       g) What do we need biasing?

Q.2   a) Derive the expression of ripple factor for Inductive type filter.   08
       b) Explain voltage divider biasing technique with its stability factor.   07

Q.3   a) Explain center tapped rectifier and derive its ripple factor with circuit diagram and 07
           waveforms?

       b) Write down the derivation of ripple factor of LC type filter.   08

Q.4   a) Explain in brief about Enhancement type N channel MOSFET?   08
       b) Write a short note on Fixed Bias circuit?   07

Q.5   a) Derive the relation between alpha and beta by using basic currents of BJT?   08
       b) Explain the construction and working of N channel JFET with its significance?   07

Section B

Q.6   Attempt any five from the following: 10
       a) List h-parameter notation for common base transistor configuration
       b) Draw the symbol of P channel depletion type MOSFET and N channel depletion type
           MOSFET.
       c) State the classification of power amplifier.
       d) What is early effect?
       e) What do we mean by drift in amplifier?
       f) Draw the frequency response of CE amplifier?

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g) Why do we use h parameter for the analysis of BJT?

Q.7   a) Explain class C power amplifier & derive its collector efficiency.   07
      b) Explain class-B push pull amplifier & cross over distortion occur in it.   08

Q.8   a) Transistor connected in CE configuration has the following h-parameters $h_{ie} = 1.1$ K Ω, $h_{re} = 2.5 \times 10^{-4}$ $h_{fe} = 50, h_{oe} = 25 \mu s$ $R_s = R_L = 1K\Omega$ calculate current gain, i/p impedance & voltage gain.   08

      b) Derive the expression of positive and negative feedback with their block diagram.   07

Q.9   a) Explain the circuit of double tune amplifier in detail?   08
      b) Explain the concept of push pull amplifier in power amplifier with the waveforms   07

Q.10 a) State and derive the expression for miller theorem?   08
      b) Explain hybrid pi model with its expression?   07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1287
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem-III)
Electronic Devices & Circuits
[Revised]

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

Please check whether you have got the right question paper.

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

Section A

Q.1   Attempt any five from the following: 10
        a)   What is Rectifier?
        b)   What is PIV?
        c)   What do you mean by filter?
        d)   What is Stability factor?
        e)   What is early effect?
        f)   What do we need biasing?
        g)   What are the different modes of BJT?

Q.2   a)   Derive the expression of ripple factor for LC type filter.   08
        b)   Derive the expression of ripple factor for capacitive type filter.   07

Q.3   a)   Explain Bridge rectifier and derive its ripple factor with circuit diagram and waveforms?   07
        b)   Derive the expression for IB, IC & VCE for the base bias method.   08

Q.4   a)   Derive the expression of Stability Factor for CE configuration.   08
        b)   Write a short note on DC load line?   07

Q.5   a)   Explain the construction and working of P channel JFET with its significance.   08
        b)   Explain the construction and working of P channel enhancement type MOSFET with its   07
             significance.

Section B

Q.6   Attempt any five from the following: 10
        a)   State the classification of power amplifier.
        b)   What do you mean by Drift in amplifier?
        c)   Why do we use h parameter for the analysis of BJT?
        d)   Draw the symbol of P channel depletion type MOSFET and N channel depletion type
             MOSFET.
        e)   What is Differential Amplifiers?
        f)   What is the formula for efficiency in power amplifiers?
        g)   Define Amplifier?

1

Q.7 a) Explain Emitter follower circuit and derive the expression for input impedance. 07
     b) Explain CB configuration and derive the expression for voltage gain. 08

Q.8 a) Transistor connected in CE configuration has the following h – parameters hie = 1.1K 08
        ohm, hre = 2.5×10^{-4} hfe = 50, hoe = 25μ siemens Rs =RL= 1K ohm calculate current
        gain, i/p impedance & voltage gain.
     b) Explain bark hausen criterion and derive the expression of positive and negative feedback 07
        with their block diagram.

Q.9 a) Explain the circuit of single tuned amplifier in with its applications? 08
     b) Explain the concept of push pull amplifier in power amplifier with the output waveform? 07

Q.10 a) State and derive the expression for class A power amplifier theorem? 08
     b) State and derive the expression for class C power amplifier theorem? 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-1321
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem-III)
Electrical Engineering Materials
[OLD]

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

Please check whether you have got the right question paper.

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

SECTION A

Q.1   Solve any FIVE from following   10
    a) Define Polarization.
    b) Write applications of PV Cell.
    c) List the good solid insulating materials.
    d) Define Breakdown Voltage.
    e) Define magnetic permeability.
    f) What are soft and hard magnetic materials.

Q.2   (a) Explain the term polarization. Explain electronic polarization with neat diagram.   08
    (b) Explain ionic polarization in detail.   07

Q.3   (a) List different types of photoelectric cells. Explain construction and working of a photo   08
    voltaic cell with neat diagram
    (b) Differentiate between breakdown voltage and breakdown strength.   07

Q.4   (a) What are ferrites? Give their properties and applications.   08
    (b) Differentiate Soft and hard magnetic materials.   07

Q.5   Write short notes (Any Three)   15
    (a) Piezoelectricity
    (b) Ionization of gases
    (c) Liquid Insulating Materials
    (d) Ferri-magnetism

SECTION B

Q.6   Solve any FIVE from following   10
    a) What is thermal bi – metal?
    b) Which material is used for fuse? Give its properties.
    c) What is mean by "Nano" in Nanotechnology?
    d) List the applications of BN Nano tubes.

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H-1321

e) For what purpose Gauss-meter is used?

f) IS 6798 is used for what purpose.

Q.7	(a) Explain the properties of good Conducting materials. List good conducting materials.	07
	(b) State the properties and applications of: i) Tungsten ii) Carbon	08
Q.8	(a) With neat diagram explain Carbon nanostructure and Carbon molecules.	08
	(b) Explain the applications of Carbon Nano tubes and BN Nano tubes	07
Q.9	(a) Explain the testing of high voltage bushings.	07
	(b) Explain how flux density is measured with the help of Gauss Meter.	08
Q.10	Write short notes (Any Three)	15
	(a) Thermal Bimetal	
	(b) Carbon Cluster	
	(c) IS 6798	
	(d) Nickel-Chromium Alloy	

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Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1322
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem-III)
Power Plant Engineering
[Revised]

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

Please check whether you have got the right question paper.

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

Section A

Q.1 Answer any five of the following: 10
   a) Explain Penstock and its use.
   b) Explain superheater and its use.
   c) Write the function of valve house & turbines.
   d) Draw and explain cascaded hydro power plant.
   e) Draw a neat diagram of pumped storage power plant and label its parts.
   f) Explain Rankine cycle.
   g) Write about Live & Dead Storages.

Q.2 a) Explain with diagram the function of air preheater, economiser, cooling tower, alternator, steam turbine and draught system in a thermal power plant.   08
   b) Explain the site selection of Thermal Power Plant.   07

Q.3 a) Explain the working of Hydro power plant with neat diagram.   08
   b) Explain different types of boilers with neat diagrams.   07

Q.4 a) What is a turbine? Explain the different types of turbines.   08
   b) Explain the different parts of a hydro power plant.   07

Q.5 a) It has been estimated that a minimum run off of approximately 126 m^3/ sec will be available   08
   at a hydraulic project with a head of 57m. determine
   i.   Firm capacity
   ii.   Yearly gross output. Assume the efficiency of the plant to be 84%.
   b) Explain pumped storage hydro power plant.   07

Section B

Q.6 Answer any five of the following: 10
   a) Explain Nuclear reaction.
   b) List out examples for nuclear fuel, coolant, control rods & moderators.
   c) Define load curves & load duration curves.
   d) Define diversity factor & Plant factor.

1

	e)	What do you mean by Base load power plants?	
	f)	Explain uncontrolled chain reaction and its application.	
	g)	List out the peak load power plants.	
Q.7	a)	Explain Chain reaction with relevant chemical reactions and diagram.	08
	b)	List the criteria for site selection of nuclear power plant.	07
Q.8	a)	Explain working of gas power plant with the help of neat diagram.	08
	b)	Explain working of Diesel power plant with a neat labelled diagram.	07
Q.9	a)	Explain the working of Combined heat and power plant.	08
	b)	Explain Grid and how itcan reduce the number of backup power plants.	07
Q.10	a)	Explain Tariff and its various types in detail.	08
	b)	Explain the advantages of gas power plants.	07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1369
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem-III)
Renewable Energy Resources
[OLD]

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

Please check whether you have got the right question paper.

N.B
1. Question no 1 from section A and Question no 5 from section B are compulsory.
2. Solve any two questions from remaining questions from each section.
3. Assume suitable data, if required.

Section A

Q.1   Solve any Three from following   06

    i)   Define solar constant
    ii)   What are the different methods of storing solar energy?
    iii)   What are the advantages of wind power?
    iv)   How the wind mills are classified?
    v)   What are types of Bio Gas plants?
    vi)   Write any four applications of Biomass Energy.

Q.2   a) Explain solar photovoltaic power generation.   07
                              OR
    b) What are the main components of a flat plate solar collector, explain the function of each?   07

Q.3   a) Explain briefly about the horizontal wind mills with neat sketch.   07
                              OR
    b) Derive an expression for the available power in wind.   07

Q.4   a) With the neat diagram, explain operation of IC Engine o Bio – Mass. What are its merits   07
       and demerits?
                              OR
    b) What are the types of Biogas digesters? Explain any one in detail.   07

Section B

Q.5   Solve any three from following   06

    i)   Enlist the types of Ocean Power Plants.
    ii)   Write the advantages of Ocean Power Plants.
    iii)   State the basic principle of Tidal Energy.
    iv)   Differentiate Tidal Energy and Wave Energy.
    v)   Discuss the advantages of geothermal plant.
    vi)   What are the types of geothermal energy?

1

Q.6   a) Explain the working of closed cycle OTEC plant with the help of block diagram.   07

OR

        b) Explain the principle of Ocean Thermal Energy Conversion with neat diagram.   07

Q.7   a) List various types of geothermal plants. Explain any one.   07

OR

        b) Explain the process of heat extraction from earth in geothermal plant.   07

Q.8   a) Explain the double basin type plant of Tidal energy for electricity generation using neat diagram.   07

OR

        b) Explain Small and mini Hydel Plants.   07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-1370
FACULTY OF SCIENCE AND TECHNOLOGY
S.Y.B.Tech. (Electrical) (Sem-III)
Data Structure
[Revised]

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

Please check whether you have got the right question paper.
N.B
1. Question No.1 from section A and Question No. 6 are compulsory.
2. Attempt any two questions from remaining questions each from section A and section B.
3. Figure to the right indicate full marks.

Section A

Q.1	Attempt any THREE of the following.	06
	a) Define Data structure.	
	b) Define Linear Data structure.	
	c) What is meant by sorting	
	d) Define data type and Abstract Data Type.	
	e) What is array?	
Q.2	a) Sort the sequence 3, 1, 4,1,5,9,2,6,5 using Bubble sort.	04
	b) Explain the operation and implementation of selection sort.	03
Q.3	a) Explain working of an array with example.	04
	b) Compare different sorting Algorithms.	03
Q.4	a) Explain Abstract Data type.	04
	b) Write a short note on primitive and non – primitive Data Structures.	03
Q.5	a) Write a program to implement bubble sort.	04
	b) What is pointer variable? Explain with example.	03

Section B

Q.6	Attempt any Three of the following	06
	a) Define binary tree.	
	b) What is Queue?	
	c) What is single linked list?	
	d) What are the initial values of top, front, rear?	
	e) Define degree of a tree.	
Q.7	a) What is Graph? Explain with example.	04
	b) Explain concept of linear data structure.	03
Q.8	a) Describe Binary search tree with example.	04

1

	b)	Write short note on different types of linked lists.	03
Q.9	a)	Write a program to implement stack using array.	04
	b)	Make a binary search tree for the following sequence of numbers. 45, 36, 76, 23, 89, 115, 98, 39 ,41, 56, 69, 48	03
Q.10	a)	Write a routine to insert an element in a linked list.	04
	b)	Explain working of Queue with example.	03

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-139
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-II)
AC Machines
[Revised]

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

Please check whether you have got the right question paper.

N.B   1) Q. No.1 & Q. No.6 are compulsory.
            2) Solve any two question from Q. Nos. 2 to 5.
            3) Solve any two question from question No.7 to 10.
            4) Assume suitable data if required.

"Section A"

Q.1   Solve **any Five** of following   10

        a) Write any four point of comparison between single phase & 3 phase IM.
        b) Enlist various method of speed control of Induction motor.
        c) Draw torque slip characteristic of 3 Ph Induction motor.
        d) Enlist the different starters and state necessity of starting 3-Ph Induction motor.
        e) A 3 phase,4 poles, 50Hz Induction motor runs at 1400 rpm. Determine its percentage slip.
        f) On what factors speed of Induction motor depends.
        g) Write application of hysteresis motor.

Q.2   a) In case of Induction motor, obtain an expression of rotor Copper loss in terms of rotor   07
           input.
        b) A 3 phase, 50 Hz, 4 pole Induction motor has a slip 4%. Calculate   08
                (a) Speed of motor   (b) Frequency of rotor emf
           If rotor has a resistance of 1Ω & standstill reactance of 4 Ω calculate the power factor (1) at
           standstill & (2) at speed of 1400 rpm.

Q.3   a) With neat circuit diagram explain working of direct online starter in 3 phase Induction   07
           motor.
        b) Describe any one method of speed control of 3 phase Induction motor.   08

Q.4   a) Describe the construction & working of capacitor start single phase induction motor.   07
        b) What type of motor use in following application washing machine, sewing machine,   08
           dishwasher, food mixer? State your reason.

Q.5   Write short note on **any three**   15
        a) Starting of single phase IM
        b) Shaded pole motor
        c) Universal motor
        d) double cage induction motor
        e) Induction Generator

1

H-139

"Section B"

Q.6   Solve **any five** of following   10

a) Calculate the highest speed at which 50H & 60Hz alternator can be operated.
b) Explain essential difference between cylindrical & salient pole rotor used in large alternators.
c) What is necessity of parallel operation of alternator?
d) Describe armature leakage reactance.
e) State various causes of hunting of synchronous motor.
f) State application of synchronous motor.
g) What is synchronous condenser? What are its application.

Q.7   a) Derive emf equation of Alternator   07
b) A 6 pole alternator rotating at 1000 rpm has a single phase winding housed in 3 slots per pole, the slots in groups of three being 20° apart. If each slot contains 10 conductors and flux per pole is 2×10^{-2}wb, calculate the voltage generated, assuming flux distribution sinusoidal.   08

Q.8   a) Draw phasor diagram of loaded alternator for following condition   07
   a) logging PF   b) leading PF   c) Unity PF
b) Explain working principal of synchronous motor & write application of synchronous motor.   08

Q.9   a) Explain effect of varying excitation on armature current & power factor in synchronous motor.   07
b) A 1000 KVA, 11000V, 3 phase star connected synchronous motor has armature resistance & reactance per phase of 3.5 Ω 40Ω respectively. Determine induced emf and angular retardation of rotor when fully loaded at
   a) Unity PF   b) 0.8 P.F. lagging   08

Q10   Solve **any three** short notes   15

a) V curves
b) Synchronous condenser
c) Methods of synchronization of alternator
d) Voltage regulation in alternator
e) Damper winding.

Total No. of Printed Pages:5

SUBJECT CODE NO:- H-140
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-II)
Network Analysis
[OLD]

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

Please check whether you have got the right question paper.

N.B
I. Use & assume suitable Data if required.
II. Q. no 1 from Section A & Q. no 6 Section B are compulsory.
III. Solve any two questions from the remaining questions in each section A & B

SECTION– A

Q.1   Solve any Five   10

     a.   Define Self & Mutual Inductance
     b.   State the Nortan's Theorem
     c.   What are coupled circuits? Explain it
     d.   Define Unit Step Function & Delayed Ramp Function
     e.   Replace the circuit into single current source and resistor.
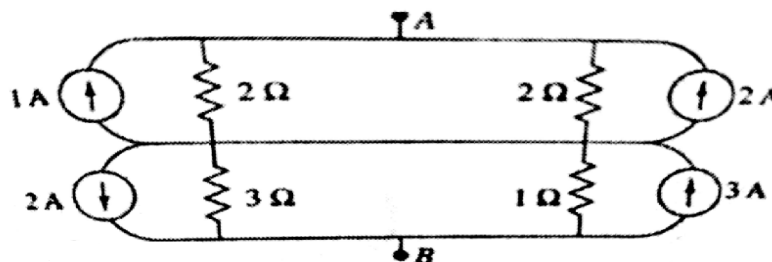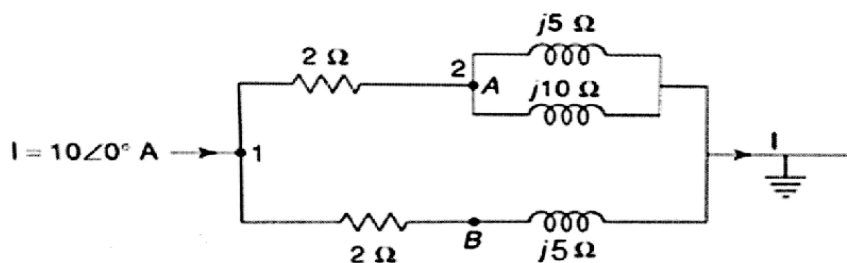

     f.   Define convolution integral.
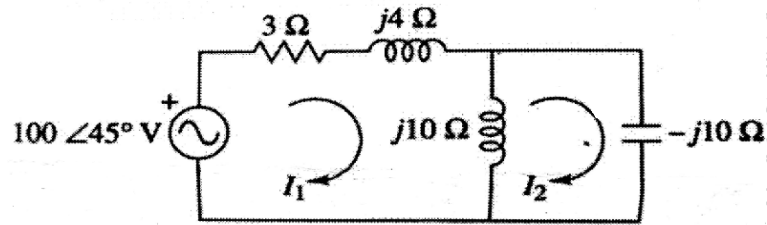   g.   State Reciprocity theorem

Q.2   (a) Find the voltage V_{AB} in the circuit using nodal analysis.   05

     (b) Find I1 & I2 in following circuit.   05
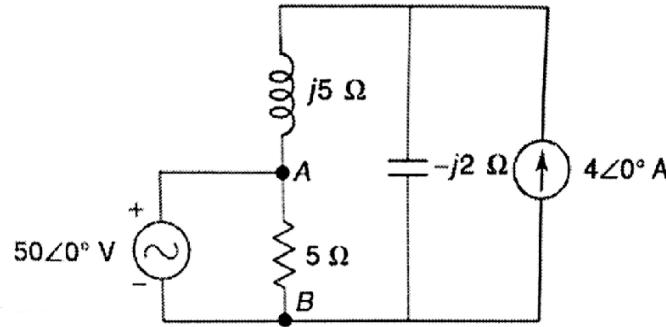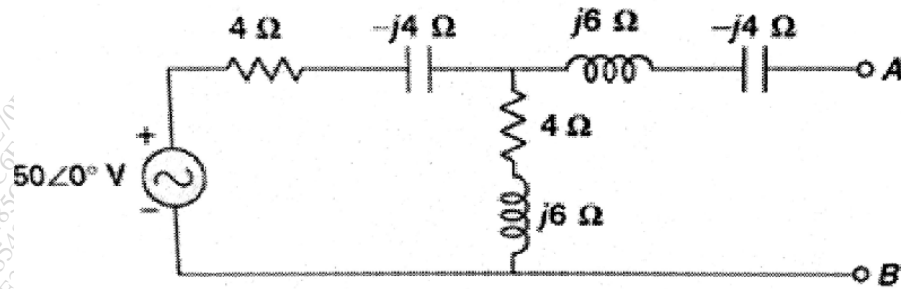
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H-140

05

(c) State & Explain Source transformation in detail with appropriate example.

Q.3   a) Determine the potential difference between A & B using superposition theorem.   05
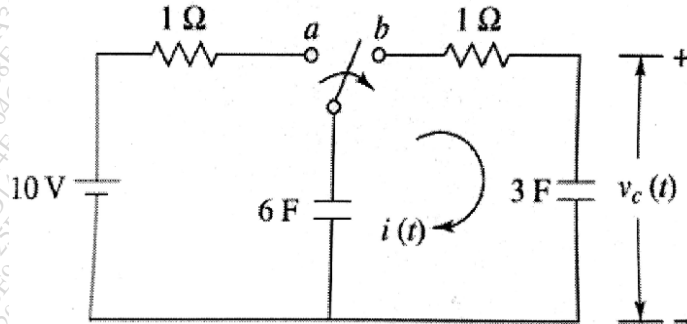

b) Explain maximum power transfer theorem along with an example.   05

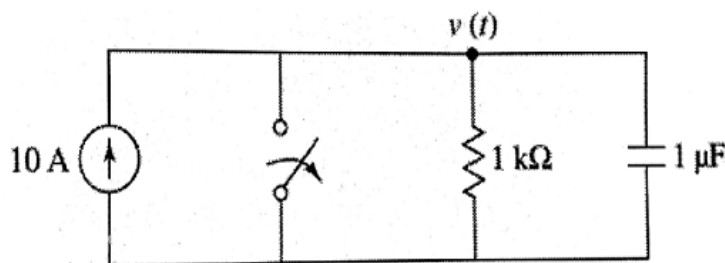c) Find the Voltage across Vab by Thevenines s theorem.   05

Q.4   a) In the given circuit switch is moved from a to b at t=0; determine i(t).   08
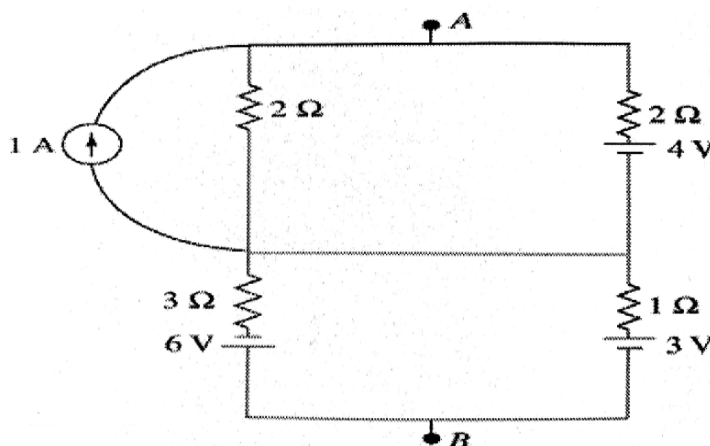

b) Find v, dv/dt & d^2v/dt^2 for following circuit.   07

2

Q.5   a) Explain Millimans Theorem with appropriate example.   07

     b) Reduce circuit into single resistor & source by using source transformation.   04

   c) Explain Source shifting in detail along with example.   04

SECTION – B

Q.6   Solve any Five   10

     a. Define & Explain voltage & current transfer function.

     b. What is reactive power? Give its physical significance.

     c. Explain restrictions on Pole & Zero locations for Driving point function.

     d. Explain Short circuit admittance parameters.

     e. Define stability of a active network.

     f. What is reactive power? Give its physical significance.

     g. What is Fourier series & what are the application of Fourier transform.

     h. Draw T-network & ladder network.

Q.7   a) The pole zero diagram of the driving point impedance function of the circuit is shown. At   08

        dc, the input impedance is resistive and equal to 2Ω. Determine the values of R, L & C.

3

07
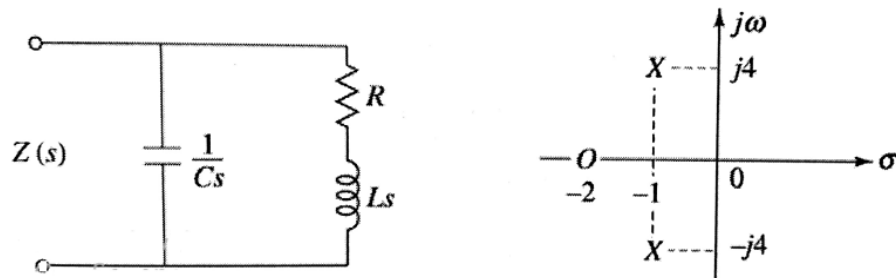
b) Determine Transfer Function V_2/V_1.
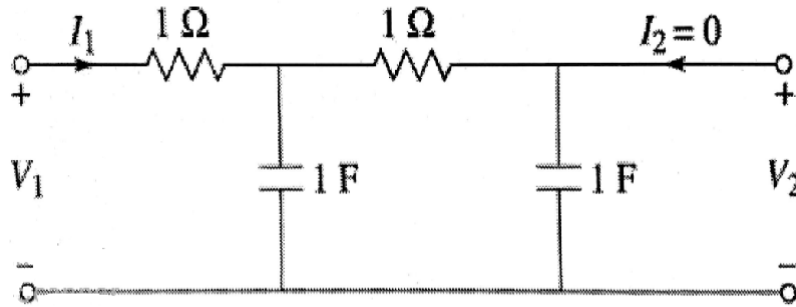
Q.8   a) Find driving point impedance of the network.   05
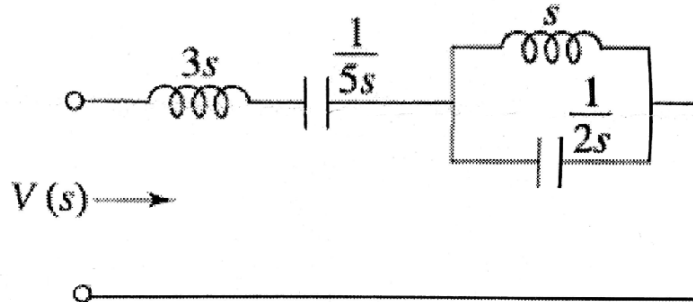
b) Explain Insertion Loss in detail.   05
c) Derive the inter conversion to convert h parameters into y parameters.   05

Q.9   a) Find Fourier Coefficient of following waveform.   05

b) Find the Laplace transform of the given waveform.   05

4

05
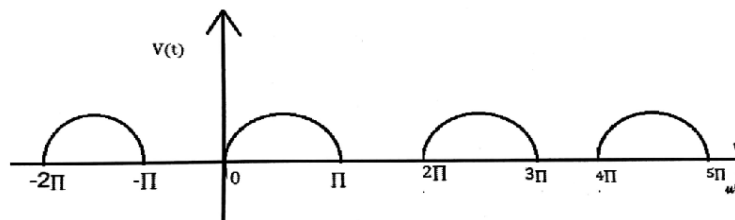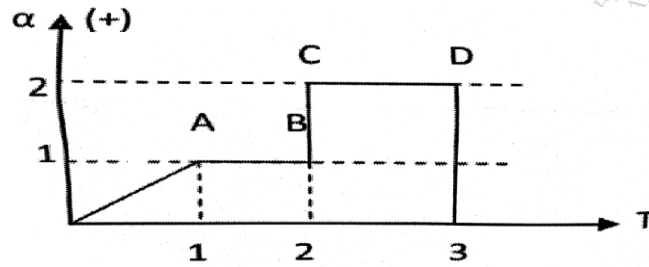
c) Explain in brief concept of even and odd functions.

Q10   a) Derive the condition of the reciprocity for Z parameters.   08

    b) Find the Fourier series for square wave defined as $f(t) = +A$ $0 < t < T/2$ 07

$$= -A \qquad \frac{T}{2} < t < T$$

Total No. of Printed Pages:05

SUBJECT CODE NO:- H-174
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-II)
Network Analysis
[Revised]

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

Please check whether you have got the right question paper.

N.B
      I.   Use & assume suitable Data if required.
      II.   Q.no. 1 from section A & Q.no.6 section B are compulsory.
      III.   Solve any two questions from the remaining questions in each section A & B.

Section A

Q.1   Solve any five.   10
      a.   Define Mutual Inductance.
      b.   Explain Unilateral & Bilateral Elements.
      c.   State the Thevenin's Theorem.
      d.   What is a dependent source? Explain Their Types.
      e.   Define Unit Step Function & Delayed Step Function.
      f.   Give the principal of Duality.
      g.   Replace the circuit into single current source and resistor.
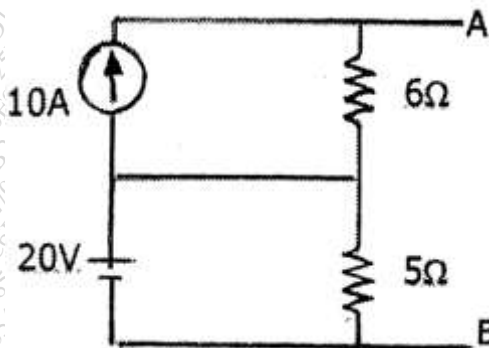
      h.   Define convolution integral.

Q.2   a) Explain the concept of Super Mesh & Super Node along with an example.   05
        b) Find the voltage V_{AB} using Mesh analysis.   05

1
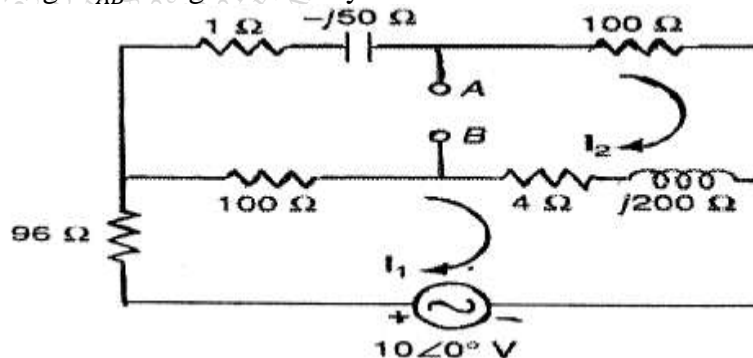
c) Find the voltage V_{AB} in the circuit using nodal analysis. 05
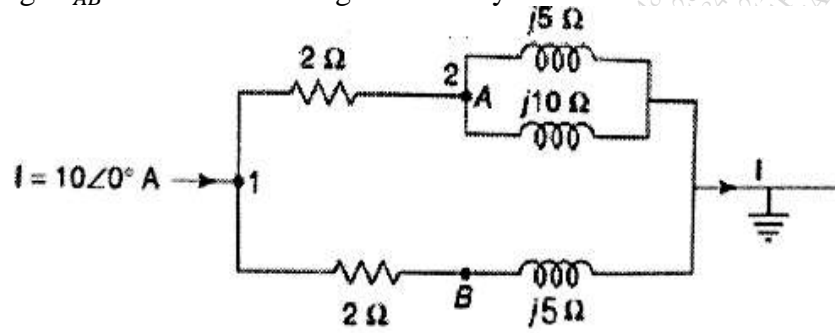
Q.3   a) State & explain Reciprocity Theorem in details along with example. 05
      b) Determine the potential difference between A & B using superposition theorem. 05
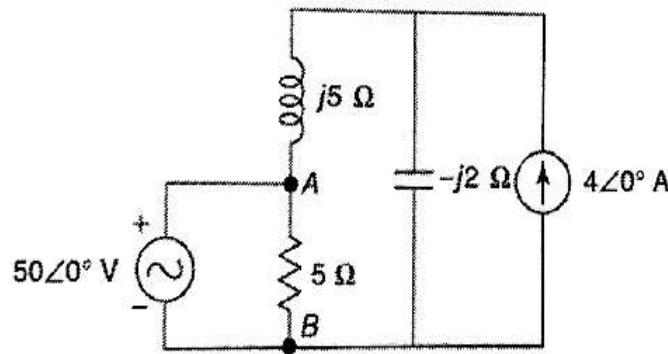
c) Obtain Thevenin's Equivalent circuit for terminal A & B. 05
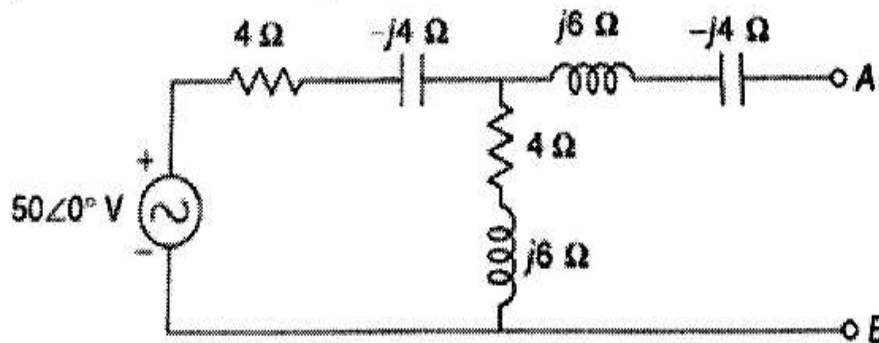
Q.4   a) Find $v, dv/dt$ & d^2v/dt^2 for following circuit. 07

$v(t)$

2
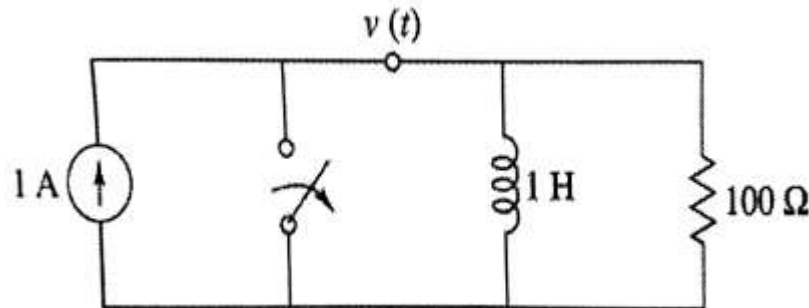
b) In the given circuit switch is moved from a to b at t = 0; determine i(t).   08
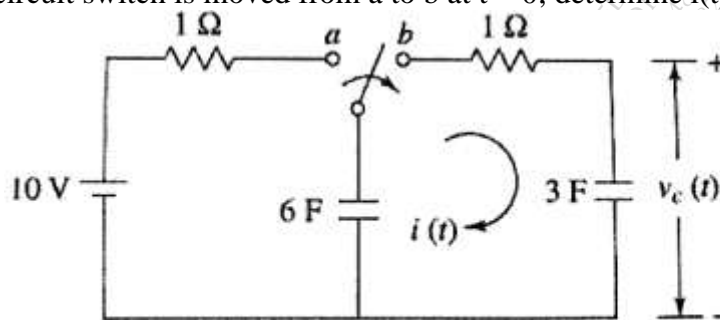
Q.5   a) State Nortons theorem and find its equivalent network for given circuit.   07
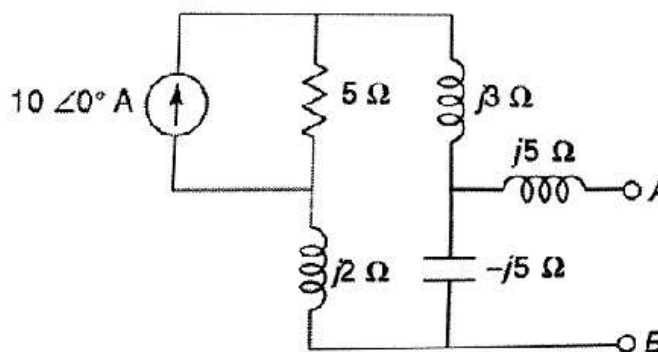
b) Explain Source transformation in detail with example.   04
c) Explain source shifting in detail along with example.   04

Section B

Q.6   Solve any five   10
    a. What is two port networks?
    b. What is reactive power? Give its physical significance.
    c. Write Y parameters of two port network.
    d. Define Fourier coefficients.
    e. What is stability of active network?
    f. Draw T network & Ladder Network.
    g. What are the applications of Fourier transform.
    h. Explain restrictions on pole and zero location for transfer functions.

Q.7   a) Find driving point admittance function of the network.   05

3
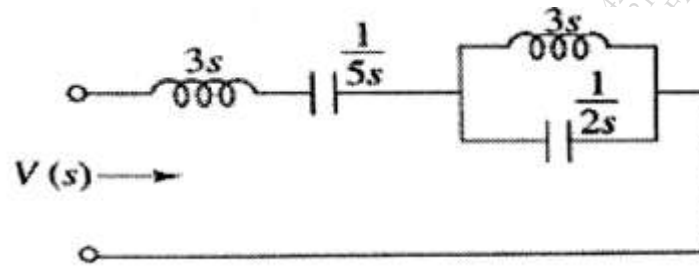
b) Explain the necessary conditions for transfer functions. 05
c) Determine Transfer function V_2/V_1. 05
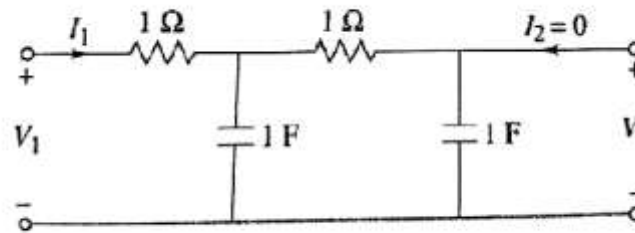
Q.8   a) Draw Pole zero diagram of I_2/I_1.   05
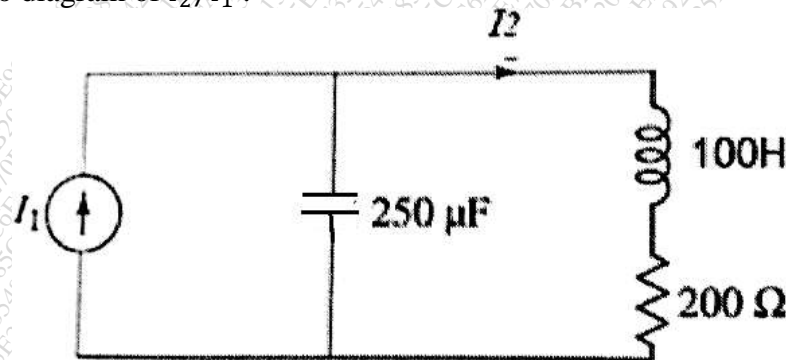
b) State the limitation on pole & zero location in transfer function of two port network. 05
c) Explain Insertion loss in detail. 05

Q.9   a) Find Fourier coefficient of following waveform.   05

b) Find the laplace transform of the given waveform.   05

4
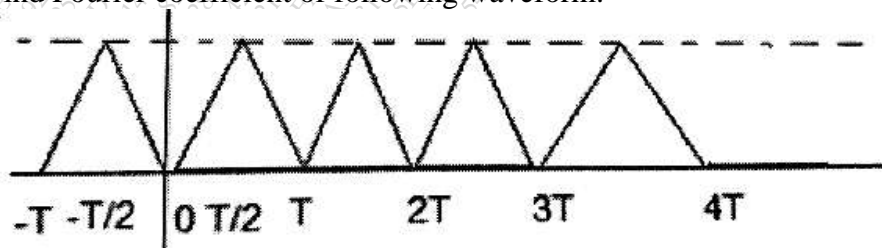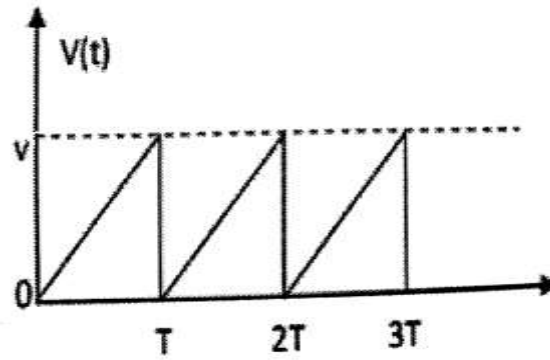
c) Find Inverse Laplace transform of given function.　　　　　　　　　　05

$$F(s) = \frac{s + 2}{s(s + 3)(s + 4)}$$

Q.10　　a) State different types of interconnection of two port network. And explain any one in detail.　05

　　　　b) Derive the complete form representation of Fourier series.　　　　　05

　　　　c) Find the Fourier series for square wave defined as　　　　　　　　　05

$$f(t) = +A \qquad 0 < t < T/2$$
$$= -A \qquad T/2 < t < T$$

5

Examination Nov/Dec 2019

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-175
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-II)
Electrical Power Transmission & Distribution
[OLD]

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

Please check whether you have got the right question paper.
N.B
    i.   Q. No.1 and Q. No.6 are compulsory.
    ii.   Attempt any two questions from Q. No.2 to Q. No.5 from section A.
    iii.   Attempt any two questions from Q. No.7 to Q. No.10 from section B.

Section A

Q.1   Attempt any five   10
    a) What is back rate tariff and flat rate tariff?
    b) What is proximity effect?
    c) Define Incentives and Penalties of a Distribution system.
    d) State advantages of HVAC transmission.
    e) Define and state the formula of String efficiency.
    f) Classify transmission line on the basis of voltages.
    g) Define the Radial Distribution system.

Q.2   a) Define and explain Unsymmetrical spacing.   05
    b) Compare EHVAC and HVDC transmission system.   05
    c) Explain the Requirements of a Distribution system.   05

Q.3   a) Show that in a string of suspension Insulators, the disc nearest to the conductor has the highest voltage across it.   05
    b) What are surge arrestors? Where and why do we use these equipment's.   05
    c) The line of a $3-\emptyset$ system is suspended by string of three insulators, if the voltage across the line unit is $18KV$, calculate the line to neutral voltage. Assume the shunt capacitance between each insulator and earth is $1/_{7th}$ of the capacitance of the insulator itself. Also find the string efficiency.   05

Q.4   a) Derive the expression for nominal T method.   05
    b) The towers of heights 45m and 80m respectively support a transmission line Conductor at water crossing. The horizontal distance between the towers is 450 meters. If the tension of the conductor is 1500 kg, Find the minimum clearance of the conductor at water and clearance midway between supports. The height of the conductor is 1.5 Kg/m. the base of the tower can be considered to be at water level.   05
    c) Explain the different types of Overhead line insulators.   05

Q.5   Write short notes on (any three):   15
       a) Load forecasting
       b) Methods of Improving String Efficiency
       c) Ferranti Effect
       d) GMR and GMD

Section B

Q.6   Attempt any 05 Questions   10
       a) What is the effect of Capacitance in a transmission Line?
       b) What is the main purpose of armoring?
       c) What is meant by sag? Illustrate the same with the help of a figure.
       d) What is meant by transposition of a conductor? Define with the help of a figure.
       e) State two methods of locating cable fault.
       f) What are ABCD constants?
       g) What is a cable? State its necessity.

Q.7   a) Derive the expression for single phase capacitance with and without earth effect.   05
       b) Discuss the various types of line supports.   05
       c) A $3\emptyset$, $50hz$, $132kv$ overhead line has conductors placed in a horizontal plane 5m apart.   05
           The conductor diameter is 23mm. if the line length is 100 km, calculate the charging current
           per phase assuming complete transposition.

Q.8   a) Derive the expression for capacitance of a 3 phase line with unsymmetrical spacing.   05
       b)   Find the values of ABCD constants for nominal II method.   05
       c) A three phase 50hz transmission line, 100kms long, delivers 250MW power at 0.9 power   05
           factor lagging and 110 kv. The resistance and reactance of line per phase per Rilometer are
           0.25Ω and 0.45Ω respectively. The capacitive admittance is 2.5×10^{-6} Siemens per km
           per phase. Using nominal T method, calculate current and voltage at sending end and the
           transmission Efficiency.

Q.9   a) Explain the Grading of Cables.   05
       b) Explain with neat sketches the methods of laying underground cables in special locations.   05
       c) A single core cable for use on 11kv, 50hz system has a conductor area of $0.645cm^2$ and the   05
           internal diameter of the sheath is 2.20cm. The permittivity of the dielectric used in the cable
           is 4. Find:
           i.   The maximum electrostatic stress in the cable
           ii.   Minimum electrostatic stress in the cable.
           iii.   Capacitance of cable per km length
           iv.   Charging current.

Q.10   Write short notes on: 15
       a) XLPE cables
       b) Construction of an underground cable
       c) Effect of Ice and wind loadings on Sag.

2

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-209
FACULTY OF SCIENCE AND TECHNOLOGY
S.E (EE/EEE/EEP) (Sem-II)
Electrical Power Trans. and Distri.
[Revised]

[Time: 03:00 Hours]   [Max. Marks:80]

Please check whether you have got the right question paper.
N.B.:1) Q. No. 1 and Q. No. 6 are compulsory.
    2) Attempt any two questions from Q. No. 2 to Q. No. 5 from Section A.
    3) Attempt any two questions from Q. No. 7 to Q. No. 10 from Section B.

Section - A

Q.1	Attempt any five:-	10
	a) Define Demand Factor and Diversity Factor.	
	b) List the various types of Insulators.	
	c) Define Incentives and Penlaty of a Distribution System.	
	d) Define Tariff. List Different types of tariff.	
	e) Define Ring Main & Radial Distribution System.	
	f) Define Skin Effect.	
	g) Define String Efficiency. What is the significance of 100% String Efficiency.	

Q.2   a) Write a note on Power Factor Tariff and Three Part Tariff.   05
        b) State the three parameters of a Transmission Line. What is the effect of line parameters 05
           on performance of Transmission Lines?
        c) Write a note on the different types of overhead line Insulators. 05

Q.3   a) What are Surge arrestors? Where and why do we use these equipment? 05
        b) Why are bundled conductors used for transmission voltage above 220 kv? 05
        c) Each line of a 3 ϕ system is suspended by a string of three similar Insulators. If the 05
           voltage across the line unit is 17.5kv. Calculate the line to neutral voltage. Assume
           Shunt Capacitance between each insulator and earth is $1/8^{th}$ of the capacitance of the
           insulator itself. Also find the string efficiency.

Q.4   a) Explain What is GMR and GMD? 05
        b) Compare EHV AC and HvDC transmission system. 05
        c) A short three phase overhead transmission line with impedance per phase $5 + j20\Omega$ has 05
           sending end voltage of 46.85 kv and Receiving end voltage of 33 kv at 0.8 P.F. lagging.
           Calculate : i) Current   ii) Transmission Efficiency

Q.5   Write Short Notes On (Any Three) 15
        a) Load Forecasting
        b) Substation
        c) Methods of Improving String Efficiency
        d) Switches and Isolators.

1

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Section B

Q.6   Attempt any five:-   10

    a) Write any four differences between nominal T and nominal Π method.
    b) What are the effects of lagging and leading Power Factor of the load on regulation?
    c) What is the effect of capacitance on Transmission line?
    d) What is meant by short, medium and long transmission Line?
    e) What is the function of armoring in a cable?
    f) What is meant by transposition of conductors? Draw figure.
    g) What is Sag? Illustrate with a figure.

Q.7   a) Derive the expression for capacitance of a 3-ϕ Line with equilateral spacing.   05
    b) Discuss the suitability of various types of overhead lines.   05
    c) Draw a neat sketch of underground cable and explain its constructional feature.   05

Q.8   a) Explain the phenomenon of Cororna. What are the factors affecting it and how can it be reduced?   05
    b) Explain nominal T-network with vector diagram.   05
    c) A 3-ϕ line delivers 3800 kW at a Power Factor of 0.8 lagging to a load. If the sending end voltage is 45 kV, determine: 05
       1) Receiving End Losses
       2) Line Current
       3) Line Losses
       4) Transmission Efficiency

Q.9   a) Explain with a neat sketch the methods of laying underground Cables in special locations.   05
    b) Using Rigorous Methods derive the expression for sending end voltage and current for a long Transmission Line.   05
    c) A 3ϕ, 50 hz, 132 kv overhead line has conductors placed in a horizontal plane 4m apart. The conductor diameter is 2 cm. If the line length is 100 km, calculate the charging current per phase assuming complete Transposition.   05

Q.10   Write Short Notes on (any 3)   15
    a) Effect of Ice and Wind Loadings on Sag
    b) XLPE Cables
    c) Capacitance Grading
    d) ABCD Parameters

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-210
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-II)
A.C. Machines
(OLD)

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

Please check whether you have got the right question paper.

N.B
1. Questions no.1 & 6 are compulsory.
2. Attempt from each section any two questions from reaming questions.
3. Assume suitable data if required.

Section A

Q.1   Solve any five   10
1) Why does slip vary with load
2) What is meant by plugging
3) On what factors speed of induction motor depend
4) Why single phase induction motor do not have starting torque
5) Compare between squirrel cage rotor and phase wound rotor
6) Why slots of Induction motor are usually skewed
7) What type of motor would you use in following application washing machine, sewing machine state your reason.

Q.2   a) Explain in details different stages of power development in Induction motor.   07

b) A 6 pole , 500V, 50HZ, 3phase induction motor running at 950r.p.m takes input power   08
of 40kw the stator loss are 1 KW & the friction &windage losses 2kw calculate
1) Slip   2) rotor   cu loss iii) shaft power 4) efficiency

Q.3   a) With neat circuit diagram explain working of ster delta startor for 3 phase Induction   07
motor.

b) Explain in detail double – revolving field theory of single phase induction motor.   08

Q.4   a) Explain in detail torque slip and torque speed characteristics of induction motor.   07

b) In induction motor show that T starting $\propto V^2$ (T − torque , V − voltage)   08

Q.5   Write short note (any three)   15
1) AC servo motor
2) Double cage Induction motor
3) Rotor resistance startor
4) Repulsion motor

1

Section B

Q.6 Solve any five   10
- a) What are advantages of short pitching or chording in alternator
- b) What is the necessity of parallel operation of alternator
- c) Draw equivalent circuit of synchronous motor
- d) Draw vector diagram of loaded alternator for leading p.f
- e) Enlist different torques considered in selection of synchronous motor
- f) Comment on 'V' curves of synchronous motor
- g) Why poles & pole shoes are laminated.

Q.7
- a) Derive an emf equation of alternator.   08

- b) Find value of Kd for an alternator with 9 slots per pole for following cases   07
  1) One winding in all slots
  2) One winding using only the first 2/3 of the slots/ pole
  3) Three equal winding placed sequentially in 60° group

Q.8
- a) Explain zero power factor method for obtaining voltage regulation in alternator   07

- b) With neat sketch explain construction & working of 3 phase synchronous generators   08

Q.9
- a) Draw phase diagram of synchronous motor and explain in detail effect of load charges on synchronous motor.   08

       07

- b) Find power angle when a 1500 KVA 6.6KV, 3 phase, Y connected alternator having resistance of 0.4Ω and reactance of $6\ \Omega$ per phase delivers full load current at norml rated voltage& 0.8 p.f lag

Q.10 Write short note (any three)   15
  1) Describe synchronous condenser
  2) Damper winding
  3) Synchronous motor V curves
  4) Methods of synchronizing in alternator

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-281
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-II)
Analog and Integrated Circuits
[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 from each section any two questions from the remaining questions.
            iii) Assume suitable data if necessary.

SECTION (A)

Q.1   **Answer Any Five**   10

a) What is Window Detector?
b) Define Slew Rate.
c) What is Virtual ground concept?
d) What is Analog multiplier?
e) State Salient features of IC555
f) Draw Astable multi vibrator using IC555.
g) What is Ideal op-amp?
h) What is BICMOS?

Q.2   (a) Draw and explain the block diagram of operational amplifier.   08
         (b) What are the compensation techniques of op-amp? Explain Noise and frequency   07
             compensation, of op-amp.

Q.3   (a) What is Schmitt trigger?   08
             Explain Schmitt trigger IC LM339

         (b) Draw and explain function generator IC 8038   07

Q.4   (a) Explain operation of op-amp as INTEGRATOR with neat circuit diagram and output   08
             waveforms.
         (b) Explain working of triangular wave generator with circuit diagram and output waveforms. 07

Q.5   **Write notes on [Any three]**   15
         a) Precision Half wave rectifier
         b) Instrumentation amplifier
         c) Low voltage ac and dc voltmeter
         d) Current to voltage converter.

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SECTION (B)

Q.6 **Answer any five** 10

  a) What is Band Pass filter?
  b) State applications of PLL.
  c) What is Load Regulation?
  d) What is Capture Range & Lock Range?
  e) What is KRC filter?
  f) What is VCO?
  g) What are the advantages of IC Regulators?
  h) Define frequency Response of filter.

Q.7 (a) Design a high pass filter at cutoff frequency of 1 KHz with pass band gain of 2. 08
  (b) What are the active filter performance considerations? Explain. 07

Q.8 (a) What is Analog and Digital phase detector? Explain 08
  (b) Explain application of PLL as frequency demodulation. 07

Q.9 (a) Draw and explain functional block diagram of IC 723 voltage regulator. 08
  (b) What is Switching Regulator? Explain its block diagram. State salient features of IC 78540 07

Q.10 Write notes on [Any three] 15
  a) Multiple Feedback filters
  b) CD4046CMOSPLL
  c) Linear Voltage Regulator using op-amp.
  d) Phase shift oscillator using op-amp

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-282
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-II)
Analog & Digital Circuits
[OLD]

[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) Attempt two question from remaining questions in each section.
        3) Assume suitable data wherever necessary.
        4) Figure to right indicate full marks.

Section A

Q.1	Solve any five:	10

    1) Write short notes on Schmitt trigger.
    2) Give the applications of OP-amp.
    3) Draw the pin diagram of IC 555.
    4) What is the difference between binary code & BCD
    5) State the applications of V to I converter & I to V converter.
    6) What is Peak detector?
    7) Draw the circuit diagram of full wave rectifier using OP-Amp.
    8) Define α & β of BJT.

Q.2   (a) Explain with the neat diagram, the class B push pull amplifier?   08
        (b) Define the operation of first order low-pass filter with neat circuit diagram.   07

Q.3   (a) Compare CB, CC and CE Configuration of BJT amplifier.   08
        (b) Explain generation of sine and triangular wave using OP-amp.   07

Q.4   (a) Describe the IC 741 and IC 324 with neat circuit diagram.   08
        (b) Explain common base configuration of BJT.   07

Q.5   Write short note on: (Any three)   15
    (1) First order high pass filter
    (2) Push Pull Amplifier.
    (3) Explain integrated circuit.
    (4) Common collector configuration

Section B

Q.6   Answer any five: 10
1) Explain the Procedure for BCD addition?
2) Perform the following conversion $(1029)_{10}$ to gray.
3) Convert the hexadecimal number E3FA.
4) Add $1A8_{16}$ and $67B_{16}$.
5) Convert the gray code number 11011 to binary.
6) Convert binary number 11011110 into it's decimal equivalent.
7) Convert the binary number 1011 to gray code.

Q.7   (a) Explain the working of Demultiplexer.   08
               (b) Explain edge triggered JK flip – flop in detail   07

Q.8   (a) DrawAND, OR & NOT logic using NOR gate.   08
               (b) Explain SR & JK flip flop.   07

Q.9   (a) Explain K-map to minimize the following SOP expression $ABCD + AB\overline{C}\,\overline{D} + A\overline{B}\overline{C}D +$ 08
               $\overline{A}\overline{B}CD + A\overline{B}CD + \overline{A}\overline{B}C\overline{D} + AB\overline{C}\overline{D} + A\overline{B}C\overline{D}$.
               (b) Draw & explain 4 bit up-down counter.   07

Q.10   Write short note (Any three)   15
(1) Explain SOP and POS form.
(2) Show the K-map with the encircled groups for the Boolean function
     $F = C^{'} + A^{'}D^{'} + A'B'D'$
(3) RAM and PROM
(4) Demorgon's theory.

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-330
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-I)
Transformers & DC Machines
[Old]

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

Please check whether you have got the right question paper.
N.B.: i) Q.No.1 and Q.No.6 are compulsory.
        ii) Solve any two questions from Q.2 to Q.5.
        iii) Solve any two questions from Q.7 to Q.10.
        iv) Assume suitable data wherever necessary.

Section – A

Q.1   Answer the following (any five):   10
        a) Why rating of transformer is in KVA?
        b) Write two comparisons of core and shell type transformer.
        c) What are the losses in transformer?
        d) Why parallel operations of transformer is necessary?
        e) What is Ideal transformer? Draw it's no load phasor diagram.
        f) Why efficiency of transformer is maximum in comparison with all electrical machines.
        g) A 330 v/220v transformer takes 0.5Amp at Power Factor of 0.3on open circuit. Find magnetizing and active component of no laod primary current.
        h) Give two applications of stepper motor.

Q.2   A. Draw a complete phasor diagram for a transformer when the load power factor is lagging.   08
        B. Explain O. C and S.C test on single phase transformer. With neat sketch diagram.   07

Q.3   A. A transformer is rated at 100 KVA at full load its copper loss is 1200 watt and its   08
           iron loss is 960 watt, calculate:
           i.   Efficiency at half load, unity power factor.
           ii.   Efficiency at half load, 0-8 power factor.
        B. Explain the construction details of Three phase transformer with neat diagram.   07

Q.4   A. Explain construction and working principle of PMDC motor.   07
        B. Explain construction and working of D.C servo motor.   08

Q.5   Write a short note on following (Attempt any three):   15
        a) Open delta or V.V connection & transformer.
        b) Scott connection.
        c) Phasor groups & transformer as per clock notation.
        d) Tertiary winding.
        e) Three winding transformer.

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SECTION B

Q.6   Answer the following (any five):   10
a) What is working principle of D.C generator?
b) What is the function of yoke in D.C machine?
c) What is the significance of back emf?
d) Why D.C shunt motors called as constant speed motors.
e) A supply voltage of D.C shunt motor is 120V and back emf is 110V and armature resistance is 0.4Ω what is current drawn by motor?
f) Why starter is necessary for starting D.C motor?
g) What is function of Commutator in D.C machine?
h) What are applications of DC Compound motor?

Q.7   A. Draw a section of four pole D.C machine. Label all parts and explain function of each part.   07

B. A 4 pole D.C shunt generator with lap connected armature has field and armature resistance of 80Ω and 0.1Ω respectively. It supplies power to 50 lamps, rated to 100 volts, 60 watt each. Calculate total armature current and generated EMF, by allowing a brush drop of 2 volt per brush.   08

Q.8   A. Derive torque equation of DC. Motor.   07
B. Explain various characteristics of D.C series motor. Why DC series motor cannot start at low load condition?   08

Q.9   A. Explain armature reaction in DC machines. What do you understand by the concept of demagnetizing and cross magnetizing ampere turns.   08

B. Explain with diagram speed control methods of D.C shunt motor.   07

Q.10 Explain the following (any three):   15
a) Three point starter.
b) Swinburne test.
c) Voltage buildup of D.C. generator.
d) Losses in D.C. machines.
e) Speed control of DC Compound motor.

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-331
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EE/EEE/EEP) (Sem-I)
Transformer and DC Machines
[Revised]

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

Please check whether you have got the right question paper.
N.B.:1. Q. No. 01 and 06 are compulsory.
    2. Attempt total three questions from each section.
    3. Make suitable assumptions whenever necessary by stating the same.

Section – A

Q.1		Answer the following (Any five):	
	a.	What is star – star connection? What are its merits and demerits?	2
	b.	What are the limitations of PM stepper?	2
	c.	Why is core of transformer laminated?	2
	d.	What is the need of parallel operation of transformer?	2
	e.	Why is rating of transformer given in KVA?	2
	f.	What is scott connection? Draw its connection diagram.	2
	g.	Draw speed-torque characteristics of D.C servo motor.	2
	h.	Name the type of material used for transformer core giving reason.	2

Q.2   a)   A 4KVA, 200/400V, single phase transformer has equivalent resistance and reactance referred to low voltage side equal to 0.5 ohm and 1.5 ohm respectively. Find the terminal voltage on the high voltage side when it supplies 3/4th full load at power factor of 0.8, the supply voltage being 220V.
Hence, find the output of the transformer and its efficiency if the core losses are 100W.   08

        b)   State the condition for parallel operation of Two three phase transformer.   07

Q.3   a)   With the help of neat circuit diagram explain how S.C. test is conducted on single phase transformer   05

        b)   A 50KVA single-phase transformers of 2300V/230V rating has the primary and secondary winding resistance of 2Ω and 0.02Ω respectively. The iron losses equal to 412 Watts. Calculate the efficiency: i) at half full load ii) at full load, when the power factor of the load is 0.8.   05

        c)   Derive the condition for maximum efficiency of transformer.   05

Q.4   a)   Explain voltage regulation of transformer and discuss the impact of nature of loads on the voltage regulation of transformer.   05

        b)   Derive the emf equation of single phase transformer.   05

        c)   What are the different transformer connections? Give application of each.   05

Q.5   Write short notes on following (Any three):
        a.   Variable reluctance stepper motor.   05
        b.   PMDC Motor.   05
        c.   D.C. servomotor.   05
        d.   BLDC Motor.   05

e. Copper saving in auto transformer.   05

SECTION B

Q.6   Answer the following (Any five):

a. How is unidirectional toque produced in case of D.C motor?   02
b. D.C series motor is never started on no load, Why?   02
c. What is back emf in case of D.C motor?   02
d. Why is starting current of D.C Motor is high? How is it reduced?   02
e. Enlist the different types of D.C generator.   02
f. What are the causes for the failure of the generator to build?   02
g. Draw speed torque characteristics for D.C. shunt and series motor.   02
h. Why is starter necessary for D.C. motor?   02

Q.7   a. Explain different power stages of generator   07
        b. Explain the functions of the following in D.C. machines.   08
            i. Interpoles
            ii. Compensating winding.

Q.8   a. A 250 volts D.C. shunt motor has an armature resistance of 0.2 ohm on load it takes   05
            on armature current of 50A and runs at 750 rpm if the flux of motor is reduced by
            10% without changing the load torque find the new speed of motor.
        b. What do you mean by field critical resistance? Explain the necessary conditions for   05
            voltage build up of shunt generator.
        c. Explain in detail speed control method of D.C. shunt motor.   05

Q.9   a. Explain any one type of starter used for DC shunt motor.   05
        b. Explain various method of improving commutation in D.C machine.   05
        c. A 250V, D.C shunt motor on no load runs at a speed of 1000rpm and takes a current   05
            of 5A. The armature and shunt field resistance are 0.2Ω and 250Ω respectively.
            Calculate the speed when the motor is on-load and is taking a current of 50A.
            Assume that armature reaction weakens the field by 3%.

Q.10   Write short notes on following (Any Three):
        a. Three point starter.   05
        b. Armature reaction in DC machine.   05
        c. Significance of Back emf in DC motor.   05
        d. Construction of DC machine.   05
        e. Swinburne test.   05

2

SUBJECT CODE NO: H-365
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-I)
Electrical Measuring Techniques
(OLD)

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

Please check whether you have got the right question paper.

N.B   i)   Q. No. 1 from section A and Q. No.6 are from section B compulsory
        ii)   Attempt any two questions from the remaining questions of each section
        iii) Assume suitable data whenever required

Section A

Q.1   Solve any five questions of the following   10
        a) Define the term linearity & dead zone
        b) List any four static characteristics of measuring system
        c) Define the terms as reproducibility & span
        d) Explain absolute instrument
        e) What are the different sources & detectors used in ac bridges?
        f) What are advantages of polyphase wattmeter?
        g) Give the classification of measurement resistance with range of resistance
        h) What are the advantages of extension of wattmeter?

Q.2   a) Describe the construction and working of PMMC instrument   07
        b) An ac bridge is connected as below: 08
            Arm AB: is an unknown impedance;
            Arm BC:200Ω variable resistance
            Arm ED: variable resistance of 250Ω;
            Arm CD: resistance of 200Ω;
            Arm DA: resistance of 200Ω;
            Arm CE; capacitor of 1µf
            The supply is connected between AC & detector is connected between BE. Determine
            resistance & inductance of AB

Q.3   a) Derive the expression of moving iron instrument.   08
        b) The resistance of moving coil voltmeter is 12000Ω, the moving coil has 100 turns & is 07
            $4cm \times 3cm$ wide. The flux density in air gap is 6×10^{-2} tesla. Find the deflection produced
            by 300 volts. If the spring control gives deflection of one degree for a torque of $25 \times 10^{-7} Nm$.

Q.4   a) Explain the construction and working of an electrodynamometer type of wattmeter   08
        b) A $3\emptyset, 440V$ motor load has a power factor 0.6 two wattmeter connected to measure the power 07
            show the input to be 25KW. Find the reading in each instrument?

Q.5   a) Explain shunt & multipliers for extension range of ammeter & voltmeter   08
        b) Explain the construction and working of megger   07

Section B

Q.6   Solve <u>any five</u> of the following   10
   a) What are the applications of CRO?
   b) What is the different between dual trace and dual beam CRO?
   c) What is the effect of shaded band on energy meter?
   d) What is meant by meter constant of energy meter?
   e) How PT is differing from a power transformer?
   f) What do you understand phase angle error of PT?
   g) What do you mean by active and passive transducers? Give one example
   h) What is strain gauge?

Q.7   a) Explain with block diagram the operation of electronic energy meter   08
      b) A 230V, 1∅ watt hour meter has a constant load of 4amp passing through it for 6 hours at   07
         unity power factor. If the meter disc makes 2208 revolutions during this period determine the
         meter constant in revolution per kwh. Calculate the power factor of the load if the numbers of
         revolution made by the meter are 1472 when operating at 230 volt & 5Amp for 4 hours.

Q.8   a) List the advantages & disadvantages of electrical transducers.   08
      b) What are the advantages of CT and PT over shunt and multipliers for range extension?   07

Q.9   a) Explain power measurement in 3∅ system for unbalanced load using three wattmeter methods 08
      b) Explain the method for frequency measurement by lissajous pattern   07

Q.10 a) Explain the working of low power factor wattmeter   08
      b) Explain working & construction of 3∅ energy meter. How we can correct if it is fast moving? 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-366
FACULTY OF SCINECE AND TECHNOLOGY
S.E. (EE/EEE/EEP) (Sem-I)
Electrical Measuring Techniques
[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 any two questions from remaining questions of each section
3. Assume suitable data wherever necessary.

Section -A

Q.1   Solve any five questions: 10
- i)   What is need of calibration?
- ii)   What is difference between absolute error and relative error?
- iii)   What are advantages of polyphase wattmeter?
- iv)   What are different types of detectors used in AC bridges?
- v)   Define quality factor.
- vi)   A meter reads 136.6V and the true value of the voltage is 136.52v determine static error & static correction for this instrument.
- vii)   Why eddy current damping not possible is moving iron instruments.
- viii) Define the terms linearity & dead zone.

Q.2   a) Explain the construction & principle of kelvin double bridge.   08

b) The four arms of Maxwell Bridge are arrange as follows AB & BC are non reactive   07
resistance of 250 Ω each DA is standard variable reactor of resistance 35.2Ω& CD
comparasies a standard variable resistor R. in series with a coil of unknown impedance
balance is obtained when L=25.6 mH and R=
25Ω. find the resistance & *inductance of coil*.

Q.3   a) Derive the expression for torque of a moving iron instrument.   08

b) The resistance of moving coil voltmeter is 12000 ohm the moving coil has 100 turns and   07
is 4cm long & 3 cm wide. The flux density in the air gap is 6×10^{-2} weber / m^2. Find the
deflection produced by 300v if the spring control gives a deflection of 1° for a torque 25
$\times 10^{-7}$ N/m.

Q.4   a) Derive the expression for power measurement is 3 ϕcircuit with help of 2 – wattmeter for   08
balanced star connected load.

1

07

b) Two wattmeter connected to measure the power supplied to 3 ϕ 600v, circuit Indicate total input 20kw. The p.f is 0.3 lagging find the reading on each wattmeter.

Q.5   a) Explain with neat sketch the construction & working of megger.   08

b) Explain shunt & multipliers for extension of range of ammeter and voltmeter.   07

Section – B

Q.6   Solve any five questions: 10

      i)   What is strain gauage?

      ii)   What is cathode Ray oscilloscope (CRO)?

      iii)   How does PT differs from power transformer.

      iv)   What do you understand by the phase angle of P.T

      v)   What is meant by transducer?

      vi)   What is effect of shaded bond on energy meter?

      vii)   A ϕ.5 A, 230Vmeter on full load unity p.f test makes 60 revolution in 360secs of the normal disc speed 500rev/kwh what the percentage error?

      viii) Advantages of universal shunt.

Q.7   a) What are different errors occurs in 1ϕ conventional energy meters?   08

b) A single phase kwh meter makes 500 revolution per kwh it is found on testing as making 40 revolution in 60secs at 5 kw full load find the percentage error and unit recorded.   07

Q.8   a) Explain the basic principle of Inductive and capacitve transducer.   08

b) Draw the block diagram of CRO and explain each block.   07

Q.9   a) Difference between CT & PT.   08

b) Explain the resistive and inductive transducers.   07

Q.10   a) Explain working of low power factor wattmeter.   08

b) Explain the block diagram of digital energy meter.   07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-399
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEP/EE/EEE) (Sem-I)
Electrical Power Generation & its Economics
[OLD]

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

Please check whether you have got the right question paper.

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

Section – A

Q.1   Solve any five questions.   10
       a) What is the function of moderation and coolant?
       b) Write the function of nuclear reactor.
       c) What is the importance of coal crushing?
       d) Write the types of boilers.
       e) Write the drought systems
       f) Write the functions of Gates
       g) Define Hydrology
       h) Write function of shield in nuclear reactors.

Q.2   a) List out main parts of a reactor and briefly state their functions.   05
       b) What are the advantages and disadvantages of the nuclear power station?   05
       c) Explain economizer in detail.   05

Q.3   a) What are the methods of producing nuclear reaction? What is chain reaction?   05
       b) What are the factors of selection of site for hydroelectric stations?   05
       c) Write short note on Condenser.   05

Q.4   a) Write short note on penstock.   05
       b) What are the types of a steam turbine? Explain.   05
       c) What are hydraulic turbines?   05

Q.5   a) What are the types of fuels used in thermal power plants?   05
       b) What are the function of economizer and super heater in a thermal power plant?   05
       c) Explain fire tube boilers.   05

SECTION – B

Q.6   Solve any five questions.   10
       a) Define solar cell and solar array.
       b) What is a MHD generator
       c) Define fuel cell.

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d) Write application of gas turbine.
e) Write the materials used in gas turbine plant.
f) What is the base load?
g) Define fuel rate curve.
h) What are the types of wind mills?

Q.7 a) With a neat diagram explain open cycle gas turbine power plant. 05
b) Briefly explain horizontal axis wind turbine generator. 05
c) Write short note on wind mill. 05

Q.8 a) State limitations of using solar power. 05
b) Write short note on geothermal power generation. 05
c) What are the uses of solar power? 05

Q.9 a) Write short note on tidal power plant. 05
b) Describe any one method to improve thermal efficiency. 05
c) Write short note on gas turbine plant. 05

Q.10 a) What are the Constraints of economic generation? 05
b) What are the basic requirement of a peak load plant? Explain. 05
c) What are the factors affecting Cost of generations. 05

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-400
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EE/EEE/EEP) (Sem-I)
Electrical Power Generation & its Economics
[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.6 from Section B are compulsory.
    ii) Attempt any two questions from the remaining question in each section.
    iii) Assume suitable data, if necessary.
    iv) Figures to the right indicates full marks.

Section– A

Q.1	Solve any five questions	10
	a) What is hydrology?	
	b) What are the different types of boilers used in Thermal Power plant?	
	c) What is the function off precipitator in T.P.S.	
	d) What are the different types of turbine used in H.P.S.	
	e) What is rankine cycle?	
	f) Write factor considered for selection of T.P.S.	
	g) Why the overall efficiency of TPS is less that thermal efficiency?	
	h) What is whater hammer effect?	
Q.2	(a) Discuss factor to be taken into account while selecting hydro power plant.	05
	(b) Explain coal handling in T.P.S	05
	(c) Draw and explain Block diagram of H.P.S.	05
Q.3	(a) Explain working of Diesel Power Plant.	05
	(b) Explain working of Thermal Power Plant.	05
	(c) Compare NPS and HPS	05
Q.4	(a) Discuss the function of	05
	i) Penstock	
	ii) Precipitator	
	iii) Induced draught fan	
	iv) Chimney	
	v) Super heater	
	(b) Write a short note on nuclear fission and nuclear fusion.	05
	(c) Write a short note on loading and unloading in Thermal power station.	05
Q.5	(a) What are different components of nuclear power station, give their function.	05
	(b) What are different prospectus of N.P.S.	05
	(c) What are different types of nuclear reactor.	05

Section – B

Q.6   Solve any five   10

- a) What are different components of Diesel Power Plant.
- b) Give the classification of non-conventional power plant.
- c) Define : (i) Load Factor   (ii) Demand factors
- d) Define (i) Load duration curve.
- e) What are the methods to improve thermal efficiency.
- f) Draw block diagram of MHD plant.
- g) Draw incremental fuel rate curve.
- h) What is base road plant?

Q.7   (a) Draw & explain gas power plant.   05
        (b) Write a short note on fuel cell.   05
        (c) Write a short note on gas power plant.   05

Q.8   (a) Explain factors affecting cost of generation.   05
        (b) Write a short note on road allocation   05
        (c) Compare renewable & non-renewable sources of energy.   05

Q.9   (a) Write a short note on incremental fuel cost curve.   05
        (b) Write a short note on open loop & close loop cycle power plant.   05
        (c) Write a short note on geothermal power generation.   05

Q.10   (a) Give the importance of renewable energy.   05
        (b) Write a short note on solar power plant.   05
        (c) Write a short note on wind power plant.   05

SUBJECT CODE NO:- H-434
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EEE) (Sem-I)
Electronics Devices and Circuit
[OLD]

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

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

Section – A

Q.1   Answer following questions (Any five)   10
a)   What is Ripple factor?
b)   What is Load regulation?
c)   What is early effect in transistor?
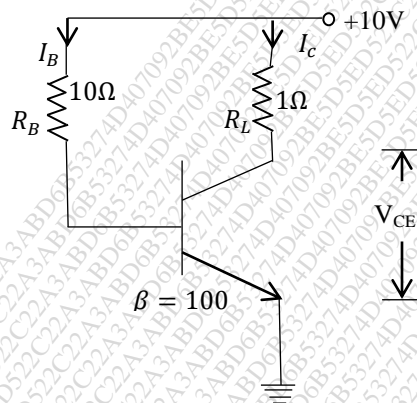d)   Find out whether the transistor of fig "a" is working in saturation or well into saturation.

Fig "a"

e)   Draw the equivalent circuit of FET & Transistor.
f)   Draw FET self biasing circuit. State advantages.
g)   What is the necessity of transistor stabilization?
h)   A FET has a driven current of 4mA. If $I_{DSS} = 8mA$ and $V_{GS}(off) = -6V$. Find the value of V_{GS} and V_P.

Q.2   (A) Explain the operation of full wave rectifier.   08
A full wave rectifier supplies a Load of 1KΩ. The a.c. voltage applied to the diode is 200-0-200 Vrms. If diode resistance is neglected, calculate,
(i)   Average dc voltage.
(ii)   Average dc current
(iii)   Ripple voltage (rms)

(B) Draw and explain the operation of voltage multiplier circuit using diode. State   07
applications.

Q.3   (A) Compare between JFET and MOSFET.   08
(B) Explain how a transistor can be tested by different methods.   07

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Q.4   (A) For the voltage divider bias configuration of fig "b", Determine (i) I_C (ii) V_E (iii) V_{CC} 08
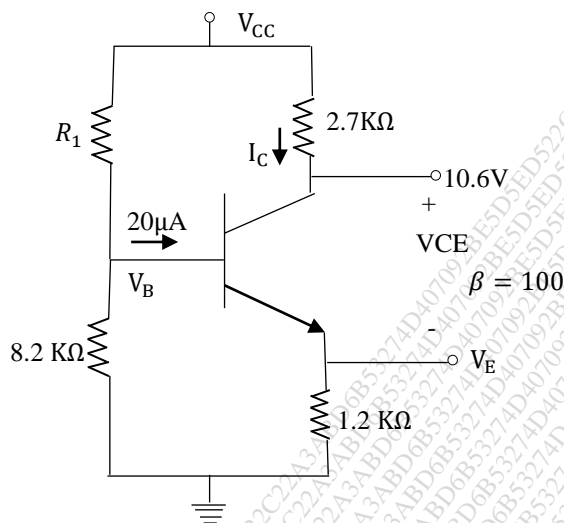(iv) V_{CE} (v) V_B and (vi) R_1

Fig "b"

(B) Draw and explain fixed bias method for transistor. Calculate stability factor for fixed   07
base biasing without emitter resistor.

Q.5   Write notes on,   15
(a) Transistor as a SWITCH
(b) LC Filter
(c) Power MOSFET

Section – B

Q.6   Answer the following (Any five)   10

a) What are the advantages of Negative feedback?
b) What is Cascade amplifier?
c) What are hybrid parameters?
d) Draw emitter follower circuit.
e) State Miller's theorem.
f) What is Push pull amplifier?
g) In a transistorized Hartley oscillator, the tank circuit has the capacitance of 100pF.
The value of inductance between the collector and tapping point is 30mH and the
value of inductance between the tapping point and the transistor base is $1 \times 10^{-8} H$.
Determine the frequency of oscillations. Neglect the mutual inductance.
h) Draw single tuned amplifier.

Q.7   (A) Draw and explain the operation of Transformer coupled amplifier. State its   08
advantages and comment on frequency response of transformer coupled amplifier.
(B) What is Differential amplifier? Explain.   07

Q.8   (A) For the circuit shown in fig (c), the transistor used has the following h-parameters: 08
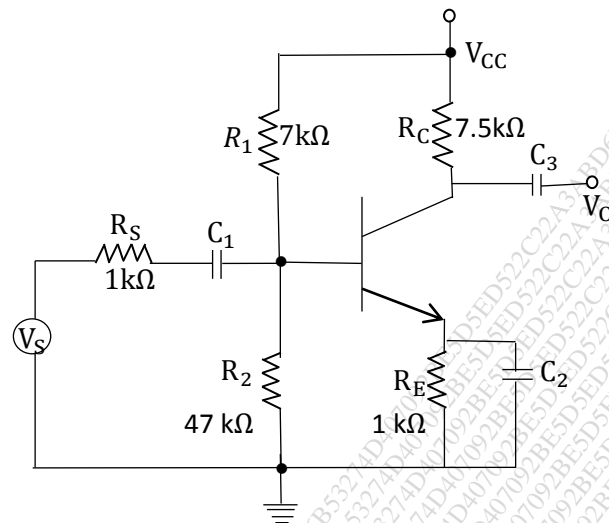h_{ie}=1.1KΩ, h_{oe}=2.5 $\times 10^{-4}$, h_{fe}=50, h_{re}=25 µA/V.

2

Fig "c"

Determine A_{is}, A_{vs}, R_i and R_o assuming all capacitors to be arbitrarily large.

    (B) Explain the operation of complementary symmetry push pull amplifiers.   07

Q.9   (A) With neat circuit diagram explain working of CRYSTAL oscillator. State advantages.   08
       (B) Explain the effect of Junction capacitance in high frequency amplifiers.   07

Q.10   Write note on,   15
     a) Stager tuned amplifier
     b) Wide Band amplifier
     c) Class C power amplifier.

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-435
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EE/EEE/EEP) (Sem-I)
Elective - I: Electrical Engineering Materials
[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 in each section.

Section A

Q.1   Attempt any five from following   10
          i)   Define polarization
          ii)   Define
               a.   Magnetization
               b.   Magnetic susceptibility
          iii)   State the properties of good Insulating Material
          iv)   List out ferromagnetic materials
          v)   Define
               a.   Breakdown voltage
               b.   Breakdown strength
          vi)   Explain the process of impregnation

Q.2   a)   What is dielectric polarization? Explain electronic polarization and ionic polarization   08
          b)   Explain with neat diagram the phenomenon of photo-electric emission.   07

Q.3   a)   Explain in detail concept of primary & secondary ionization of gases, with neat   08
              sketches.
          b)   State the properties of resins. Differentiate, in between natural and synthetic resins.   07

Q.4   a)   What are ferrites? Name some ferites & give it's applications   08
          b)   Discuss the concept of Anti-ferromagnetism   07

Q.5   Write notes on (any three)   15
          a)   SF6
          b)   Mechanism of breakdown
          c)   PV cells
          d)   Materials used for the insulations

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Section B

Q.6   Attempt any five from following   10
   a) List out different type of fuses
   b) State the working principle of thermocouple
   c) Give example of any two metals used in thermal Bimetal Relay
   d) State 'Hall effect' related to Gauss meter
   e) Define Dielectric loss angle
   f) Name two material used as an heating element
   g) List out various conducting mechanism in nanostructures.

Q.7   a) With neat diagram describe carbon capacitor tubes and Nano-wires   08
       b) Explain in details the need of alloys for thermocouples.   07

Q.8   a) Explain in detail any one conducting mechanism in nano-structures.   08
       b) What are the properties of aluminium & copper where are these materials used?   07

Q.9   a) Explain the measurement of loss tangent by schering Bridge method.   08
       b) With neat diagram explain the step by step method for measurement of dielectric   07
          Gaseous insulating materials in laboratory as per IS 2584.

Q.10   Write notes on (any three)   15
   a) Applications of Nano-materials
   b) Flux density measurement by gauss meter
   c) Molecular machines
   d) Concept of energy bands

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-436
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EE/EEE/EEP) (Sem-I)
Elective - I: Electronics Devices & Circuits
[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 two questions from Q.No.2 to Q.No.5 and Q.No.7 to Q.No.10.
3. Assume suitable data if required.

Section A

Q.1   Solve any five: 10
1) Define rectifier. Mention the types.
2) Distinguish between a cycle, time periods & frequency.
3) State the principle of operation of an LCD
4) List some applications of Zener diode
5) What is voltage regulator? List some types.
6) List some applications of JFETS.
7) Define diffusion capacitance of diode.

Q.2   a) Explain application of MOSFET as amplifier & switch? 08
       b) Explain DC analysis of differential amplifier. 07

Q.3   a) Explain constant current bias in detail. 08
       b) What are different configuration of differential amplifier? Explain any one in detail. 07

Q.4   a) What are various parameters of op-amp? Explain in detail. 08
       b) Explain diode with construction, symbol, V-I characteristics & specifications? 07

Q.5   Write short notes on the following (any three) 15
1) Comparison between BJT, FET and MOSFET
2) Explain working of JFET
3) Explain half wave and full wave rectifier
4) Op-amp & its features

Section B

Q.6   Solve any five: 10
1) What is a multivibrator? List the different types of multivibrator.
2) Difference between clippers & clampers
3) List the application of high pass RC circuits
4) Define pulse & pulse circuits
5) When two signals V_1 & V_2 are connected to the two inputs of a difference amplifier, define a difference signal Vd & common-mode signal Vc.
6) What are the applications of AMVs.

1

7) Enlist types of negative feed-backs.

Q.7   a) Explain the high frequency response of FET amplifier.   08

b) Determine the period & frequency of oscillator for an astable multi-vibrator with component 07
values.
$R_1 = 2k\Omega, R_2 = 20k\Omega, C_1 = 0.01\mu F, C_2 = 0.05\mu F$

Q.8   a) Explain with neat circuit diagram, explain the operation of RC phase shift oscillator and its   08
advantages.

b) Explain class-B complementary symmetry amplifier.   07

Q.9   a) What is video amplifier? Explain   08
b) Explain RC control blacking oscillator with neat diagram.   07

Q.10   Write short notes on the following   15
1) Class AB Amplifier

2) Define
a) Feedback
b) Positive feedback
c) Negative feedback

3) Emitter follower at high frequency

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-437
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EE/EEE/EEP) (Sem-I)
Elective - I: Numerical Method Using MATLAB
(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 two questions from remaining for each section.
3. Assume suitable data.

Section A

Q.1	Write a note on (any two)	10
	a) Array operations in MATLAB	
	b) Truncation errors	
	c) Multi-step application of trapezoidal rule	
Q.2	a) With suitable examples write program for addition, multiplication, division, subtraction.	08
	b) With suitable examples state & explain loop available in MATLAB.	07
Q.3	a) Explain in detail global & local truncation errors.	07
	b) Explain in detail Newton-Cotes integration formulae.	08
Q.4	a) Write a program to implement the composite trapezoidal rule.	07
	b) State & explain basic functions of MATLAB	08
Q.5	a) Explain numerical differentiation in single variable.	07
	b) Explain MATLAB functions for integration.	08

Section B

Q.6   Write a note on (any two)   10
        a) Linear algebra in MATLAB
        b) Second-order Runge –Kutta methods
        c) Linear least squares regression

Q.7   a) State & explain with suitable example matrix operation rules in MATLAB   07

        b) Use the multiple equation Newton Raphson method to determine roots of   08
        $x_1^2 + x_1 x_2 = 10$
        $x_2 + 3x_1 x_2^2 = 57$
        Where $x_1 = 1.6$ & $x_2 = 3.4$

1

Q.8   a)   With suitable assumption write a matlab program to implement interpolation in MATLAB.   08
           b)   Explain nonlinear regression in detailed.   07

Q.9   a)   Write a M-file to implement explicit Euler's method.   07
           b)   Explain higher order Runge-Kutta methods in detail.   08

Q.10   a)   Explain considering any case-study for ODE-IV P.   08
           b)   Write a note on stiff ODEs.   07

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Total No. of Printed Pages:2

SUBJECT CODE NO:- H-438
FACULTY OF SCIENCE AND TECHNOLOGY
S.E. (EE/EEE/EEP) (Sem-I)
Elective - I: Signal and System
[Revised]

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

Please check whether you have got the right question paper.

N.B.: 1) Q.1 & 6 are compulsory.
2) Assume suitable data.
3) Solve any two questions from remaining questions from each section.

Section – A

Q.1   Solve any two: 10
a) Define signal and explain various type of signal.
b) State and explain properties of convalution sum
c) State and explain classification of system.

Q.2   a) Explain Analog and digital signals in detailed.   07
b) Explain Discrete time processing of continuous time signal.   08

Q.3   a) Check whether following system is linear or nonlinear   a) $y(n) = Ax(n) + B$ 08
b) $y(n) = x(n^2)$.
 b) State and explain sampling theorem in detail.   07

Q.4   a) Explain even, odd & power signal in detailed.   08
b) State & explain amplitude scaling, addition, multiplication, time scaling &   07
integration of signal.

Q.5   a) Obtain a convolution sum of
a) $x(n) = \{1, -1, 0, 2\}$ 08
$$\uparrow$$
$h(n)\{-1, 1, 2, 1\}$
$$\uparrow$$

b) Test following system is stable or unstable   07
$$y(n) = \sum_{K=-\infty}^{n+1} x(k)$$

Section – B

Q.6   Solve any two: 10

a) Explain effect of under sampling in detail.
b) State & explain properties of cross correlation.
c) Properties of ESD.

Q.7   a) Explain properties of correlation.   07
        b) Find cross correlation of two infinite length sequence   08
            $x(n) = \{1, 2, 3, 4\}$ $y(n) = \{3, 2, 1, 1\}$
                  ↑   ↑

Q.8   a) Explain energy & power spectral density.   07
        b) Explain interrelation between auto correlation and ESD.   08

Q.9   a) State & explain limitation of Fourier transform.   07
        b) Explain properties of fourier transform.   08

Q.10   a) Compare CT and DT analysis of system using FT.   07
        b) Explain response of LTI system to exponential signal and periodic signal.   08