

FACULTY OF ENGINEERING

B.E. 2/4 (EEE/Inst.) II - Semester (Suppl.) Examination, December 2017

Subject : Electronic Engineering - II

Time : 3 Hours

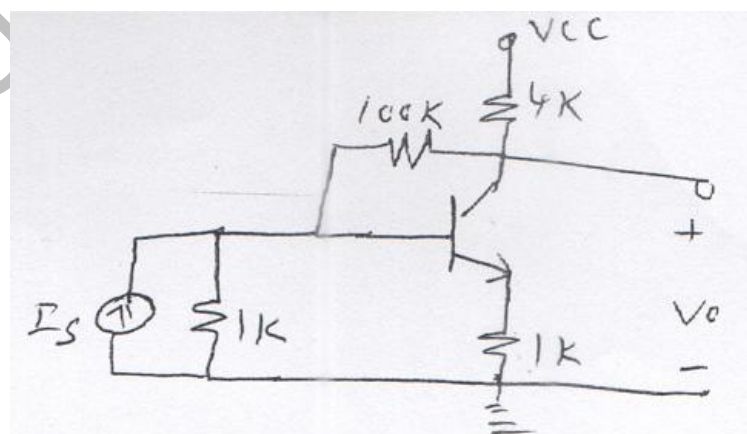
Max. Marks: 75

Note: Answer all questions from Part-A and any five questions from Part-B.**PART – A (25 Marks)**

- 1 Differentiate between Interacting and non-interacting amplifiers.
- 2 Two stages are cascaded having gains 10db and 20dB. What is the gain of cascaded amplifier.
- 3 What is the effect of current shunt negative feedback on input and output resistances of amplifier?
- 4 Write about various types of feedbacks?
- 5 Compare RC & LC oscillators.
- 6 What is frequency stability of oscillators?
- 7 Give classification of amplifiers based on location of Q-point.
- 8 Write about harmonic distortion in power amplifier.
- 9 Explain how High – Pass RC circuit is used as differentiator.
- 10 Draw a two level clipper using diodes and sketch its transfer characteristics.

PART – B (50 Marks)

- 11 Derive expressions for gain at high frequency and upper cut-off frequency of a single stage RC coupled BJT amplifier.
- 12 For the circuit shown find R_{msf} , A_{vsf} & R_{if} ? Given $h_{ie} = 1K$, $h_{fe} = 100$, $h_{re} = h_{oe} = 0$?



- 13 Derive expressions of frequency of oscillations and conditions of oscillations for a RC phase shift oscillator using BJT.
- 14 Draw the circuit of a class-AB push-pull power amplifier and explain its working. Explain how cross-over distortion is eliminated in it.

- 15 Draw circuit of a positive clamper and explain its working with output waveform. State clamping theorem.
- 16 a) Explain working principle of a crystal. Draw oscillator circuit using crystal and explain.
b) Write about stability of feedback amplifiers.
- 17 Write short notes on the following:
(a) Class-D amplifier
(b) Low pass RC circuit for ramp input

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FACULTY OF ENGINEERING**BE. 2/4 (ECE) II – Semester (Supply) Examination, December 2017****Subject: Switching Theory & Logic Design****Time: 3 Hours****Max. Marks: 75****Note: Answer all Questions from Part A and any Five Questions from Part B****PART – A (25 Marks)**

- 1 Determine the Value of base x if $(211)_x = (152)_8$? (3)
- 2 Simplify the following algebraic expression (2)
 $a + \overline{ab} + \overline{abc} + \overline{abcd} + \dots$
- 3 Distinguish between prime implicants and essential prime implicants? (2)
- 4 Realize two input XOR gate using only NOR gates? (3)
- 5 Draw the logic diagram for 1 bit comparator? (3)
- 6 Realize 8 x 1 multiplexer using 2 x 1 multiplexers? (3)
- 7 Define setup and hold time? (2)
- 8 Write the differences between latch and flip flop? (2)
- 9 Classify the shift registers and write its applications? (2)
10. Compare between synchronous and asynchronous Counters? (3)

PART- B (50 MARKS)

- 11 a) Perform subtraction operation for the following numbers (5)
 i) -34 from -15 ii) 0011.1001 from 0001.1110 using 2's complement method
 b) Simplify the following expression using Boolean algebra
 $f(x, y, z) = (x + y)(x^1(y^1 + z^1)) + x^1y^1 + x^1z^1$. And also draw its logic diagram for simplified expression (5)
- 12 Minimize the following function using Quince mc cluskey method (10)
 $F(v, w, x, y, z) = m(4, 6, 7, 9, 11, 12, 13, 14, 15, 20, 22, 25, 27, 28, 30)$
 $+ d(1, 5, 29, 31)$
- 13 Design a Circuit which Converts BCD Code into Excess – 3 code and draw its realization (10)
- 14 Explain in detail various techniques to avoid race around condition? (10)
- 15 Design a mod 5 Counter without lockout problem using JK flip flops? (10)
- 16 a) Realize full adder using only two input NOR gates and Verify its functionality using truth table? (5)
 b) Explain in detail hazard free switching circuits with example? (5)
- 17 write short notes on (10)
 a) Contact networks
 b) Universal shift registers
 c) Degenerative and Non degenerative forms

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/CSE) II - Semester (Suppl.) Examination, December 2017

Subject : Electrical Circuits & Machines

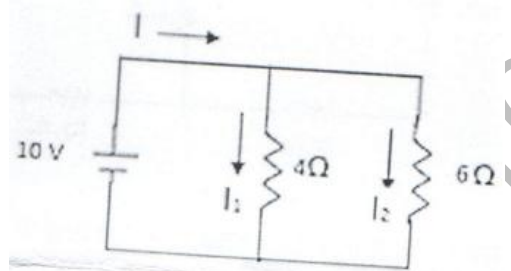
Time : 3 Hours

Max. Marks: 75

Note: Answer all questions from Part-A and any five questions from Part-B.

PART – A (25 Marks)

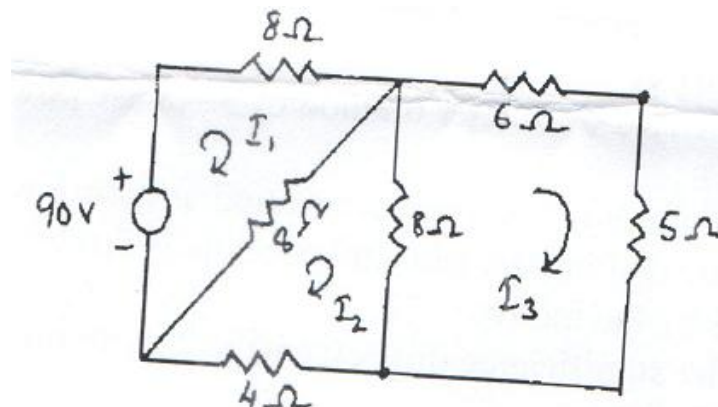
- 1 For the network shown below two resistors of 4Ω and 6Ω are connected in parallel across $10V$ battery. Determine the currents I_1 , I_2 and power observed by the circuit. (3)



- 2 What is meant by phasor? (2)
- 3 Derive the emf equation of the transformer. (3)
- 4 What do you mean by balanced load in 3-phased circuit? (2)
- 5 Define critical speed and critical resistance of a DC generator. (3)
- 6 Why should not DC series motor be started without load? (3)
- 7 Draw the Slip-Torque characteristics of 3- ϕ Induction motor. (3)
- 8 Why rotor of an 3-phase induction motor should not rotate at synchronous speed? (2)
- 9 What is the function of capacitor in a single phase induction motor? (2)
- 10 What are the ratings and applications of stepper motor? (2)

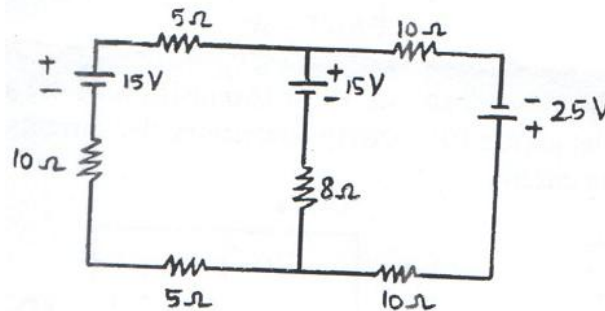
PART – B (50 Marks)

- 11 (a) Calculate current I_1 , I_2 , I_3 for the circuit shown below. (5)

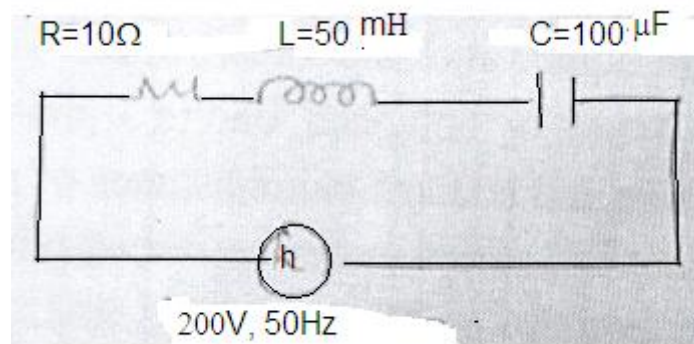


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- (b) Calculate current flow in 8Ω resistor for the network shown below by using Thevenin's theorem. (5)



- 12 For the circuit shown below calculate impedance, current, voltage across in each element, active power, reactive power and power factor. Also draw the phasor diagram. (10)



- 13 (a) Explain the principle operation of auto-transformer and how it differs from conventional transformer. (5)
 (b) A transformer supplied a load of 32A at 415V. If the primary voltage is 3320V, find the secondary volt ampere, primary current and primary volt ampere. Neglect losses and magnetizing current. (5)
- 14 (a) A 400V is applied to three star connected identical impedances each consisting of a 4Ω resistance in series with 3Ω inductance. Find (i) line current (ii) Total power supplied (5)
 (b) Explain the two wattmeter method of 3-phase power measurement. (5)
- 15 (a) A 4-pole dc motor has a wave – wound armature with 600 conductors. The armature current is 30A and flux per pole is 7 mwb. Calculate the torque developed by the motor. (5)
 (b) Explain the significance of back emf of a dc motor. Derive an expression for the back emf. (5)
- 16 (a) With a neat diagram explain the principle of operation of a star-delta starter for an 3-phase induction motor. (5)
 (b) A 3-phase, 8 pole, 60Hz induction motor has a slip of 3% at full load. Find the synchronous speed and the frequency of rotor current at full load.
- 17 (a) Explain the constructional details and principle operation of BLDC motor. (5)
 (b) Explain the principle operation and characteristics of capacitor run motor. (5)

FACULTY OF ENGINEERING

B.E. 2/4 (AE) II - Semester (Suppl.) Examination, December 2017

Subject : Automotive Petrol Engines

Time : 3 Hours

Max. Marks: 75

*Note: Answer all questions from Part-A and any five questions from Part-B.***PART – A (25 Marks)**

- 1 Write advantages of four stroke spark ignition engine. (3)
- 2 List out important parts of 4 stroke petro engine. (2)
- 3 What are the compensating devices used in carburetor? (3)
- 4 Brief air fuel ratio requirements of petrol engine from no-load to full load. (2)
- 5 Draw typical schematic diagram of spark plug. (3)
- 6 What is capacitance spark? (2)
- 7 What is homogeneous and heterogeneous mixture? (3)
- 8 How compressing ratio effect the knock? (2)
- 9 Why cooling is required in engines? Mention types of cooling systems. (3)
- 10 What are the properties of lubricants? (2)

PART – B (50 Marks)

- 11 (a) Draw the cross-section of single cylinder spark ignition engine and explain about its working. (6)
(b) What is air standard Otto cycle? Explain with suitable sketch. (4)
- 12 (a) Explain Solex carburetor and write its advantages. (6)
(b) Brief about constant choke carburetor. (4)
- 13 (a) With neat sketch explain battery ignition system in detail. (6)
(b) Why spark advance is required? Brief about advance mechanisms. (4)
- 14 (a) Explain about rate of pressure rise in SI engine. (6)
(b) Write short note on factors influencing the flame speed. (4)
- 15 (a) With schematic, explain forced circulation cooling system. (6)
(b) What is working principle of thermosiphon cooling system? (4)
- 16 (a) Explain different types of combustion chambers. (6)
(b) What are the requirements of an ignition system? (4)
- 17 (a) Why spark advance is required? Brief about advance mechanisms. (6)
(b) Write short notes on (i) Firing order (ii) MPFI (4)

FACULTY OF INFORMATICS
B.E. 2/4 (IT) II-Semester (Supplementary) Examination, December 2017
Subject : Signals & Systems

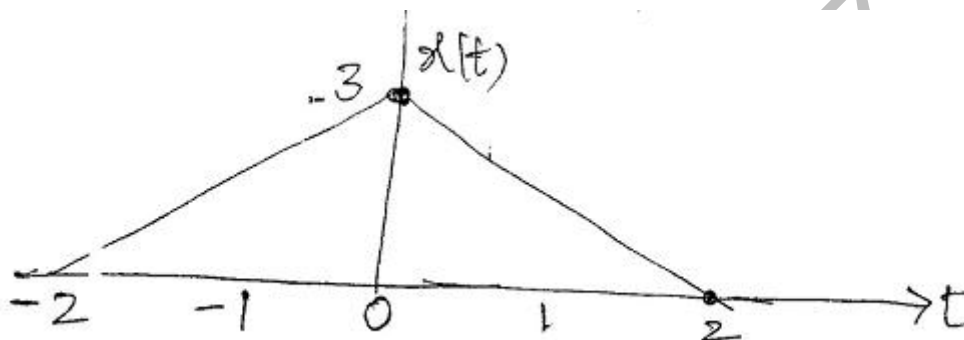
Time : 3 hours

Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

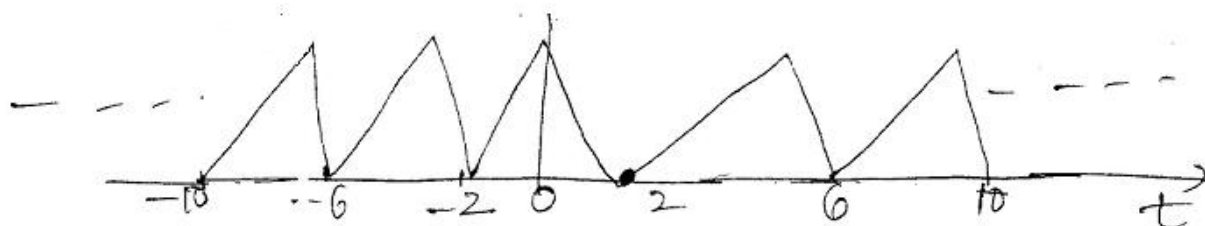
- 1 Give the classification for the systems. 2
- 2 A continuous time signal is shown below in fig plot i) $x(2t)$ ii) $x(3-t)$ 3



- 3 What is an LTI system? 2
- 4 Explain ideal filter characteristics. 3
- 5 What is ROC in Laplace transform? 2
- 6 What is sampling? 2
- 7 $x(n) = 1$ for $-3 \leq n \leq n$.
Plot $x(2n)$ and $4.x(n)$ 3
- 8 Find Z transform of $x(n) = u(n)$. 2
- 9 Briefly explain properties of DTFT. 3
- 10 Explain Nyquist sampling theorem. 3

PART – B (50 Marks)

- 11 Find the trigonometric Fourier series for the following signal. 10



- 12 Solve the differential equation using Laplace transform 10
 $y''(t) + 6y'(t) + 8y(t) = x'(t) + x(t)$
 $y'(0) = 3, y(0) = 1$ and $x(t) = u_s(t)$

- 13 a) What are the reasons for aliasing? How it can be eliminated? 5
- b) The impulse response of a LTI system is $h(n) = \{1, 2, 1, -1\}$. Determine response of the system to the input signal $x(n) = \{1, 2, 3, 1\}$. 5
- 14 a) Consider rectangular pulse $x(n) = A, |n| \leq N$
 $= 0, |n| > N$ Find DTFT. 5
- b) Solve the differential eq using Z transform
 $y(n+1) - \frac{1}{4}y(n) = \frac{1}{4}x(n), y(0) = 0, x(n) = y_s(n)$. 5
- 15 a) State whether the signal $x(t) = 4e^{3t}$ is a power signal or energy signal. 6
- b) Define following signals
 i) impulse function ii) unit step function iii) exponential function
 iv) signum 4
- 16 a) Find $z[\cdot (n-8)]$.
 b) Find Fourier transform of $n(t) = \cos |T|, -2 \leq t \leq 2$.
 $= 0, \text{ otherwise}$
- 17 a) Comparison of continuous time signal analysis with discrete time signal analysis.
 b) Parseval's theorem for FT
 c) Correlation and types

FACULTY OF ENGINEERING

B.E. II – Semester (Suppl) Examination, December 2017

Subject: Electronic Engineering- I

Time: 3 Hours

Max. Marks: 70

Note: (i) Answer All Questions From Part-A & Any five Questions From Part-B.

(ii) Missing data, if any may suitably be assumed.

PART – A (20 Marks)

1. A Germanium diode carries a current of 1mA at room temperature, when a forward bias of 0.15V is applied .Estimate the reverse saturation current at room temperature. 2
2. Calculate the band gap energy of silicon at 450°K 2
3. Define the following terms: 2
 - (a) Ripple factor
 - (b) Voltage regulation
4. Draw the circuit of bridge rectifier and explain its advantages over other rectifiers. 2
5. A transistor has $\beta = 150$. Calculate the approximate collector and base currents, if the emitter current is 1 mA. 2
6. What is Reach through effect? 2
7. What is Q- point? Explain its physical significance. 2
8. How does TRIAC differ from an SCR?. 2
9. Compare JFET & MOSFET 2
10. Draw the V-I characteristics of N-channel enhancement MOSFET 2

PART- B (50 Marks)

- 11.a) Explain V-I characteristics of p-n junction diode. Discuss the temperature dependence of p n Characteristics. 5+3
 - b) What is Zener diode? 2
- 12.a) A 230v,50 Hz voltage is applied to the primary of a 5:1 step down, centre tapped transformer in a full wave rectifier having a load of 900 . Determine (i) D.C. voltage across the load (ii) I_{dc} (iii) D.C power delivered to the load (iv) A.C input power from transformer (v) Efficiency. 5
 - b) Draw a neat block diagram of a general purpose CRO and explain function of each block. 5
- 13 a) Draw and explain output characteristics of common emitter configuration for npn transistor. 5
 - b) What is stability factor and derive it for collector to base bias and emitter bias circuits. 5

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- 14 a) A transistor has its H-parameters given by $1K$, 50 , 2.5×10^{-4} and $25 \mu A/V$ in common emitter Configuration using a load resistance of $5K$ and a source resistance of $1K$. Calculate A_V , A_{V_S} , A_I , A_{I_S} , R_i , and R_o . 6
- b) Draw the block and symbolic representation for SCR. Sketch the V-I characteristics of SCR. 4
- 15 a) Draw the structure of a JFET and explain its principle of operation with neat diagrams along with the V-I characteristics. Define pinch-off voltage and mark it on the characteristics. 6
- b) Explain the difference between construction of an enhancement type MOSFET and depletion type MOSFET. 4
- 16 a) Draw circuit diagrams of TRIAC and DIAC and explain its working principle. 5
- b) Draw the circuit diagram of UJT and explain its characteristics. 5
17. Write any two of the following: 10
- a) PN junction formation techniques
 - b) Tunnel Diode
 - c) BJT as an amplifier

FACULTY OF ENGINEERING**B.E (ECE) II – Semester (Suppl) Examination, December, 2017****Subject :Electrical Technology****Time : 3 Hours****Max Marks : 70****Note: Answer all questions from Part – A & Any five questions from Part – B.****PART – A (20 MARKS)**

1. What are the functions of commutator in a DC generator? (2)
2. Define the term speed regulation of a DC motor (2)
- 3 For the 3- phase star connected system $V_L = 420\text{ V}$, $I_L = 40\text{ A}$ Calculate power per phase when p.f is 0.8 lagging (2)
- 4 What is meant by phase sequence in 3 – phase balanced system (2)
- 5 Mention the various types of 3 – phase alternators based on their construction (2)
- 6 Define synchronous impedance (2)
- 7 Does transformer draw any current when secondary is open. Why? (2)
8. Draw the no load phasor diagram of a transformer (2)
- 9 Mention the applications of shaded pole motor (2)
- 10 What is the function of capacitor in a single phase induction motor (2)

PART – B (50 Marks)

- 11 a) A dc shunt motor runs at 950 rpm on 220V with 30A armature current. Its armature resistance is 0.8Ω What resistance is required to be connected in the armature circuit to reduce the speed to 725 rpm without changing the armature current (5)
- b) Explain the different types of DC generators with help of neat circuit diagrams (5)
- 12 a) Sketch and explain the following characteristics for series and shunt motors
 - i) Torque vs. Armature current
 - ii) Speed VS Torque
 (5)
- b) Explain simple wave winding for DC machine with help of neat schematic diagram (5)
- 13 a) Explain the two wattmeter method for 3 – phase power measurement (5)
- b) The power input to a 400 V, 50Hz, 3 - phase delta system is measured by two wattmeters are 600 W and 500 W respectively Determine total power, power factor and line current (5)
- 14 a) From basic principles, derive an expression for the emf/phase induced in an 3 – phase alternator (5)
- b) A 3- phase, 10 KVA, 420 V 50 Hz, star connected alternator supplies the rated load at 0.7 pf lagging. If the armature resistance and synchronous reactance are 0.6Ω and 5Ω respectively. Determine voltage regulation. (5)
- 15 a) Explain with neat sketches the core and shell type transformers (5)
- b) What are the losses in a transformer and how they vary with load? Deduce a condition for maximum efficiency (5)
- 16 a) Derive the torque equation of an 3 – phase induction motor (5)
- b) Explain the capacitor start motor with the help of neat schematic diagram (5)
- 17 a) Explain the production of rotating magnetic field in the 3 – phase induction motor (5)
- b) Explain the armature reaction of 3 – phase alternator (5)

FACULTY OF ENGINEERING

B.E. (CSE) II - Semester (Suppl.) Examination, December 2017

Subject : Basic Electrical Engineering

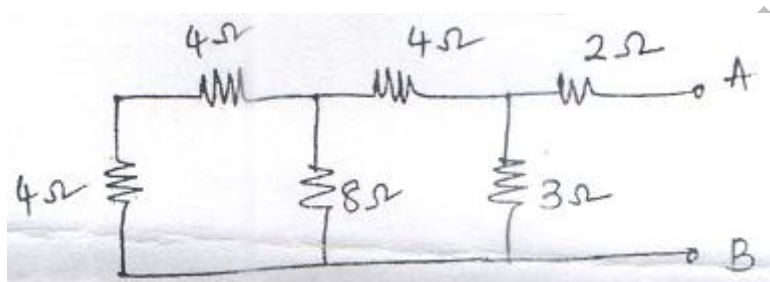
Time : 3 Hours

Max. Marks: 70

Note: Answer all questions from Part-A and any five questions from Part-B.

PART – A (20 Marks)

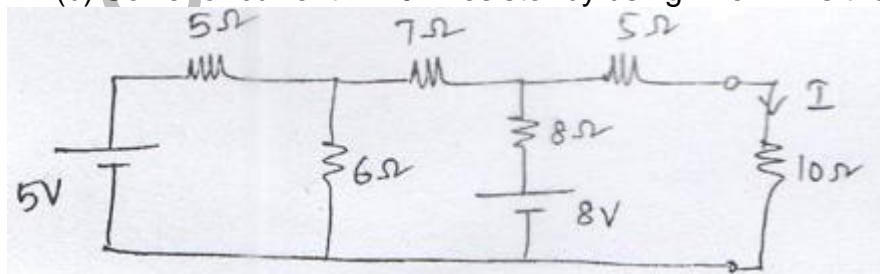
- 1 Calculate the equivalent resistance between terminal A & B for the circuit. (2)



- 2 Define Active power and Reactive power. (2)
- 3 The power input to 3- ϕ induction motor is read by two Wattmeters. The readings are 1000W and 250W respectively. Calculate the p.f. of the motor. (2)
- 4 Draw the Exact equivalent circuit of a transformer. (2)
- 5 What is Armature reaction? And what are the effects of Armature Reaction? (2)
- 6 A 220V series motor takes 50A. If the armature resistance is $0.1\ \Omega$ and the series field resistance is $0.08\ \Omega$, and then determine the back emf developed in the motor? (2)
- 7 A 6-pole, 3- ϕ Induction motor is connected to 50Hz supply. If it is running at 970 rpm, find the slip? (2)
- 8 What are different methods employed to make 1- ϕ induction motors are self starting? (2)
- 9 Define Flat demand tariff and step rate tariff. (2)
- 10 What is circuit breaker? (2)

PART – B (50 Marks)

- 11 (a) State Thevinin's Theorem. (3)
- (b) Solve for current in $10\ \Omega$ resistor by using Thevinin's theorem show in figure. (7)



- 12 (a) Differentiate Star connected and Delta connected system in 3-phase system. (5)
- (b) A 200 kVA, 1- ϕ , 50Hz, 2000/440V transformer gave the following test results:
 OC test : 2000V, 1.8A, 1.75 kW ----- on HV side
 SC test : 13V, 300A, 1kW ----- on LV side
 Obtain the equivalent circuit parameters as referred to HV side? (5)

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- 13 (a) Draw and explain the characteristics of DC Motor. (5)
(b) A compound generator is to supplied 100A at 250V. The armature, series and shunt windings have resistances of 0.06Ω , 0.04Ω and 50Ω respectively. Determine the generated emf when the machine is connected in (i) long shunt (ii) short shunt. Take drop per brush as 1V. (5)
- 14 (a) Why Starter required for 3- ϕ Induction motor, and explain any one Starting method for 3- ϕ Induction motor with neat diagram? (5)
(b) Explain briefly about double filed revolving theory. (5)
- 15 (a) Explain the two Wattmeter method with neat diagram? And draw the phasor diagram. (5)
(b) Draw and explain Torque-Speed Curve for 3- ϕ Induction Motor. (5)
- 16 (a) Write short notes on Losses in DC Machine. (5)
(b) A circuit is composite of a resistance of 12Ω and a series capacitive reactance of 60Ω , a voltage $v(t)=282.4\sin(314t)$ is applied to the circuit. Determine. (5)
(i) Complex Impedance
(ii) Effective and Instantaneous values of current
(iii) The value of capacitance in Farads
- 17 (a) What is Protective Relay? Explain with neat diagram. (5)
(b) Explain the causes of low p.f. and explain the disadvantages of low p.f. (5)
