

**FACULTY OF ENGINEERING****B.E. 2/4 (Civil) II-Semester (Supplementary) Examination, January 2016****Subject : Electrical Technology****Time : 1 ½ hours****Max. Marks : 38****Note: Answer all questions from Part-A and. Answer any three questions form Part-B****PART – A**

- 1 An alternative current varying sinusoidally, with a frequency of 50 Hz has an RMS values of 20 A. Write down the equation for the instantaneous value and find this value at 0.0025 seconds. 2
- 2 State Kirchoff's laws. 2
- 3 30 kVA, 2400/120-V, 50 Hz transformer has a high voltage winding resistance of 0.1 and a leakage reactance of 0.22 . The low voltage winding resistance is 0.035 and the leakage reactance is 0.012 . Find the equivalent winding impedance referred to high voltage side. 2
- 4 Derive the emf equation of single phase transformer. 3
- 5 Explain the principle of operation of three phase induction motor. 2
- 6 Define : Luminous flux, solid angle and depreciation factor. 3

**PART – B**

- 7 a) A balanced 3-phase star-connected load of  $8 + j6$  ohms per phase is connected to a three-phase 240V supply. Find the line-current, power-factor, active power, reactive-power, and total volt-amperes. 4
- b) Prove that average power consumption in pure inductor is zero when a.c. voltage is applied. 4
- 8 a) Explain in detail about short circuit test and open circuit test on single phase transformer. 5
- b) Derive the emf equation of a transformer. 3
- 9 a) Discuss in detail about production of rotating field in three phase induction motor. 4
- b) Explain the steps for calculation of street lightning. 4
- 10 a) A 150 – kw, 3000-V, 50-Hz, 6-pole star-connected induction motor has a star Connected slip-ring rotor with a transformation ratio of 3.6 (stator/rotor). The rotor resistance is 0.15 / phase and its per phase leakage reactance is 3.62 mH. The stator impedance may be neglected. Find the starting current and starting torque on rated voltage with short-circuited slip rings. 4
- b) An alternating voltage given by  $e = 150 \sin 100f t$  is applied to a circuit which offers a resistance of 60 ohms to the current in one direction and completely prevents the flow of current in the opposite direction. Find the r.m.s. and average values of this current and its form factor. 4
- 11 a) Discuss in detail about auto transformer starting of three phase induction motor. 4
- b) Derive the relationship between the line and phase voltages of a three phase star connected systems. 4

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**FACULTY OF ENGINEERING**

B.E. 2/4 (EE/Inst.) II - Semester (Suppl.) Examination, January 2016

Subject : Electronic Engineering - II

Time : 3 Hours

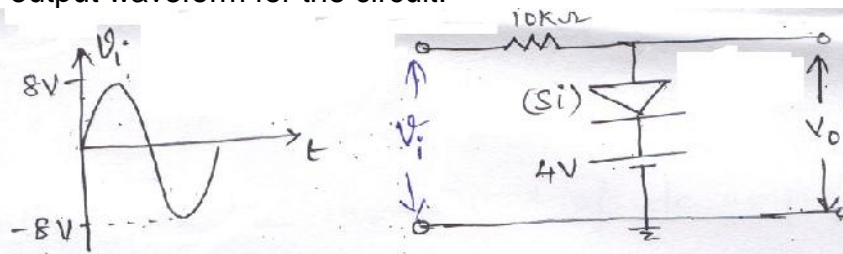
Max. Marks: 75

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

- 1 Draw the equivalent circuit of an ideal transresistive amplifier. (2)
- 2 How the negative feedback reduces the voltage gain of an amplifier? (2)
- 3 In a collpitt oscillator if  $L = 25 \text{ mH}$ ,  $C_1 = 0.4 \text{ } \mu\text{F}$  and  $f_0 = 15 \text{ KHz}$ . Find the value of  $C_2$ . (3)
- 4 Classify different types of oscillators based on frequency range. (2)
- 5 What are the applications of dc amplifiers? (2)
- 6 Define CMRR and what is its significance. (3)
- 7 What is cross over distortion and how can it be reduced? (3)
- 8 State the advantages of push pull amplifiers. (2)
- 9 Distinguish between clipping and clamping. (3)
- 10 Sketch the pulse response of High pass RC circuit for these different time constants. (3)

**PART – B (50 Marks)**

- 11 (a) What is meant by desensitivity factor? Derive the expression for the sensitivity in a negative feedback amplifier. (5)
- (b) Prove that current series feedback amplifier is transconductance. (5)
- 12 Draw the circuit diagram of Rc phase shift oscillator and explain clearly. Derive an expression for frequency and condition for oscillator. (10)
- 13 (a) What are ideal characteristics of differential amplifier? (4)
- (b) Derive expressions for the common mode gain and differential gain interms of h-parameters of a differential amplifier. (6)
- 14 (a) For a class B amplifier providing a 20V peak signal to  $16\Omega$  load (speaker) and a power supply of  $V_{CC} = 30 \text{ V}$ . Determine the input power, output power and circuit efficiency. (6)
- (b) Draw the diagram of a transformer-coupled transistor power amplifier and explain the need for impedance matching. (4)
- 15 (a) What is low pass RC circuit? Derive an expression of output voltage for square wave input and draw input-output characteristics of this circuit. (7)
- (b) Draw the output waveform for the circuit. (3)



- 16 Write short notes on :
  - (a) Harmonic distortion (3)
  - (b) Crystal oscillator (4)
  - (c) Complementary symmetry (3)
- 17 (a) Draw the circuit of Colpitt's oscillator and derive the expression for frequency of oscillation. (6)
- (b) Give the applications of clippers and clampers. (4)

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**FACULTY OF ENGINEERING****B.E. 2/4 (ECE) II – Semester (Suppl.) Examination, January 2016****Subject : Pulse Digital and Switching Circuits****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 Derive the expression for % tilt of a High pass RC circuit excited by a symmetrical square wave.
- 2 Explain positive peak voltage limiter above reference level.
- 3 What are the different triggering methods of binary circuit?
- 4 What are commutating capacitor? Why are they required?
- 5 What do you understand by minimal SOP and canonical SOP?
- 6 Simplify the following switching functions using theorems  
 $F(w, x, y, z) = x + xyz + x'yz + wx + w'x + x'y.$
- 7 Construct full subtractor using half subtractor.
- 8 Differentiate between synchronous and asynchronous sequential circuits.
- 9 Distinguish between state table and excitation table.
- 10 Explain mealy type machine with neat block diagram.

**PART – B (50 Marks)**

- 11 a) Explain the response of RL circuit when a step input signal is applied.  
 b) In a low pass circuit (RC)  $R = 2 \text{ kr}$  and  $C = 1 \mu\text{F}$  is applied as exponential input to the circuit determine the output waveform.
- 12 a) Design a monostable multivibrator to generate a output pulse of  $250 \mu\text{s}$  duration. Assume  $h_{fe}$ ;  $I_{ce}(\text{sat}) = 5 \text{ MA}$ ,  $V_{cc} = 10\text{V}$  and  $V_{BB} = -4\text{V}$ .  
 b) What do you understand by hysteresis? What is hysteresis voltage? Explain how hysteresis can be eliminated in a Schmitt trigger.
- 13 What is a astable multivibrator? Explain the principle of operation of a astable multivibrator with the help of a diagram and derive an expression for pulse width. Draw the waveforms at collector and base transistors.
- 14 Simplify the following expression using K-map and implement them in universal logic.  
 $Z_m(9, 10, 12) + d(3, 5, 6, 7, 11, 13, 14, 15)$
- 15 Design a circuit which converts binary to BCD code. Draw its realization.
- 16 Construct Moore machine whose output is, if the last five inputs are 11010 using JK flip-flops.
- 17 Write short notes on :
  - a) SCR
  - b) Diode switching time
  - c) Contact networks

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## FACULTY OF ENGINEERING

B.E. 2/4 (M/P/CSE) II – Semester (Suppl.) Examination, January 2016

Subject : Electrical Circuits and Machines

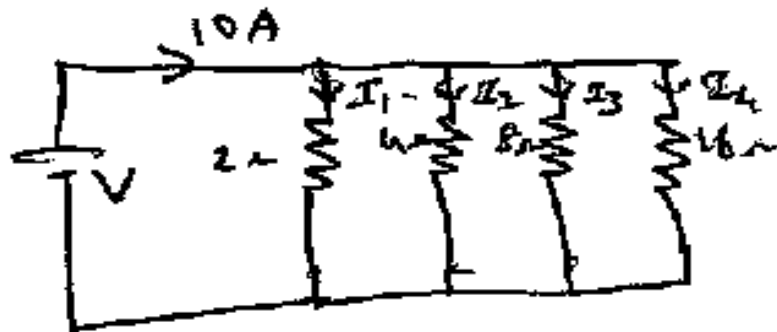
Time : 3 hours

Max. Marks : 75

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

### PART – A (25 Marks)

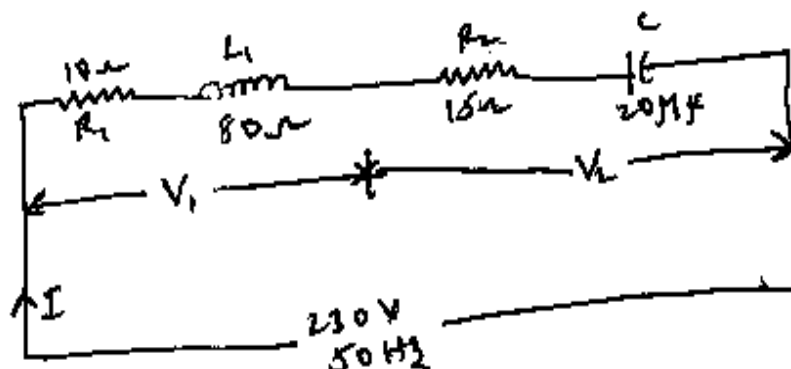
- 1 Define rms value of current. 2  
2



- For the circuit shown above calculate  $I_1$ ,  $I_2$ ,  $I_3$  and  $I_4$ . 3  
3 Draw no-load phasor diagram for a 1-phase transformer. 2  
4 Explain production of 3-phase voltages. 3  
5 Give the constructional details of D.C. machine. 3  
6 Draw (Speed Vs Torque) characteristics of D.C. shunt and series motor. 2  
7 Define synchronous speed and slip of a 3-phase induction motor. 3  
8 Mention various types of 3-phase induction motor. 2  
9 Compare brushless D.C. motor and conventional D.C. motor. 3  
10 Mention the applications of capacitor start motors. 2

### PART – B (50 Marks)

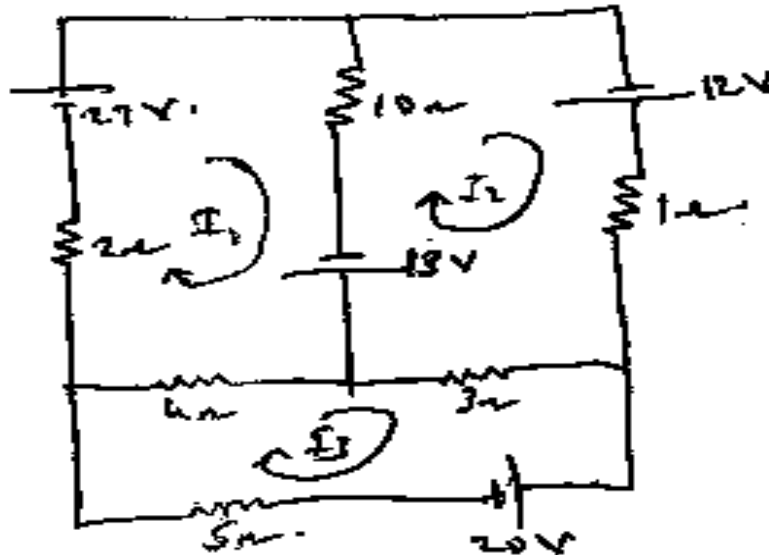
11



For the circuit shown above calculate  $V_1$ ,  $V_2$ , and  $I$  also calculate active power and p.f.10

- 2 -

- 12 a) Derive emf equation of a 1-phase transformer. 5  
 b) Explain equivalent circuit, regulation and efficiency of 1-phase transformer. 5
- 13 a) Derive the torque equation of a D.C. motor. 5  
 b) Explain production of emf in a D.C. generator and derive emf equation. 5
- 14 Explain the following for a 3-phase induction motor. 10  
 a) Speed control  
 b) Methods of starting
- 15 a) Explain constructional details and principle operation of stepper motor. 5  
 b) Explain any one 1-phase induction motor with neat schematic diagram. 5
- 16 a)



- For the circuit shown above calculate  $I_1$ ,  $I_2$  and  $I_3$ . 5  
 b) Explain two-watt meter method of 3-phase power measurement. 5
- 17 Write short notes on the following :  
 a) Energy stored in inductance  
 b) Speed- torque characteristics of 3-phase induction motor  
 c) Mutual inductance 3+4+3

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**FACULTY OF ENGINEERING****B.E. 2/4 (AE) II – Semester (Suppl.) Examination, January 2016****Subject : Automotive Petrol Engines****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 Name the structure forming and mechanism forming parts of I.C. engine.
- 2 What do you understand by the term diagram factor with respect to the indicator diagram of I.C. engines?
- 3 List the elements of fuel supply system of a petrol engine.
- 4 With a neat sketch name the parts of a magneto ignition system.
- 5 Define the terms pre-ignition and detonation.
- 6 What are the reasons for providing cooling system in I.C. engine?
- 7 Define viscosity, oiliness and film strength of lubricating oils.
- 8 What are the variations of air fuel mixture in S.I. engine during idling and cruising?
- 9 What are the factors affecting normal combustion in S.I. engines?
- 10 What are the requirements of a spark plug.

**PART – B (50 Marks)**

- 11 a) Differentiate between port timing and valve timing. 5  
 b) What is the significance of firing order in S.I. engine and also write firing order of 4 cylinder S.I. engine? 5
- 12 What are the requirements of an automotive carburetor? And explain its working principle with neat sketch. 10
- 13 Explain with a neat sketch the working of a magneto ignition system. How does it differ from battery ignition system. 10
- 14 Write the factors which are controlling the combustion chamber design in S.I. engines and also draw the different combustion Chambers of S.I. engine. 10
- 15 a) Discuss the various desirable properties of lubricants.  
 b) Describe with a neat sketch the purpose of a thermostat in pressure cooling system in automobiles.
- 16 Describe the indicator diagram of otto cycle engine. How does it differ from actual diagram?
- 17 Write short notes on :
 

a) Detonation	b) Ignition advance	c) Fuel pump
d) MPFI system		

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**FACULTY OF INFORMATICS****B.E. 2/4 (I.T.) II - Semester (Suppl.) Examination, January 2016****Subject : Computer Organization and Microprocessor****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part - A and answer any five questions from Part-B.****PART – A (25 Marks)**

- 1 Discuss different types of computer. (3)
- 2 Explain the following 8085 Instructions. (3)  
(i) ADD C (ii) ANI 50H (iii) LXI D, 8100
- 3 Name any three addressing modes of 8085, with examples. (3)
- 4 What is average memory access time? (3)
- 5 Write ALP to perform subtractions of the 8 bit numbers using 2's complement. (3)
- 6 Write about modes of transfer in 8251. (2)
- 7 What is memory mapped I/O? (2)
- 8 Differentiate between multiprocessor and multicomputer. (2)
- 9 Define Baud rate. (2)
- 10 Explain vector interrupt. (2)

**PART – B (50 Marks)**

- 11 Write historical perspective of computers in detail. (10)
- 12 Describe the organization of bit cells in memory chip in semi conductor RAM memory. (10)
- 13 (a) Explain 8085 pins in detail. (8)  
(b) Write short notes on 8085 Op-code fetch cycle. (2)
- 14 (a) Write short notes on A/D and D/A converse. (8)  
(b) Explain Pipelining process. (2)
- 15 Write advantages and disadvantages of Rs 232 standard for serial communication. (10)
- 16 Explain CWR of 8255 (PPI) in both BSR and I/O mode. (10)
- 17 (a) Explain the components of a computer with neat diagram. (8)  
(b) Explain cache memory. (2)

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