

Code: 15A99301

B.Tech II Year I Semester (R15) Supplementary Examinations June 2018

**BASIC ELECTRICAL & ELECTRONICS ENGINEERING**

(Common to CSE & IT)

Time: 3 hours

Max. Marks: 70

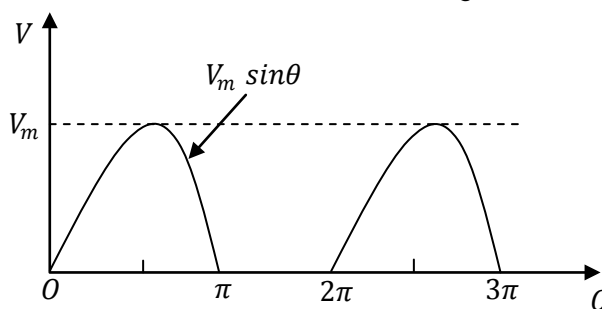
Answer all the questions  
(Use single answer booklet only)

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**PART – A**

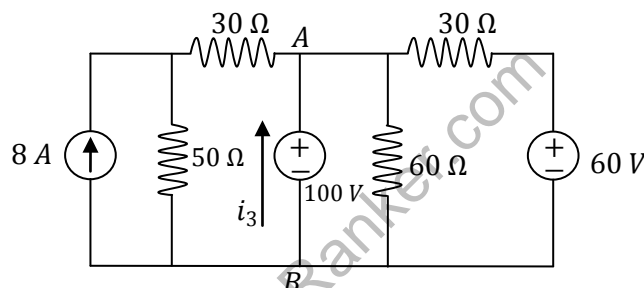
**UNIT – I**

- 1 (a) Define average value, RMS value, peak factor and form factor of an alternating quantity.
- (b) Find RMS and average value of the waveform as shown in figure below.



OR

- 2 (a) State and explain superposition theorem.
- (b) Apply the superposition principle to the circuit shown in figure to find current  $i_3$ .



**UNIT – II**

- 3 (a) Explain the principle of operation of a dc generator.
- (b) An 8-pole DC shunt generator has 778 wave connected armature conductors running at 600 rpm, supplies a load of  $12.5 \Omega$  resistance at a terminal voltage of 250 V. The armature resistance is  $0.24 \Omega$  and the field resistance is  $250 \Omega$ . Find the armature current, the induced emf and the flux per pole.

OR

- 4 (a) Describe how a Swinburn's test is conducted on DC machines. State its advantages and disadvantages.
- (b) Find the efficiency at half load for a 600 V shunt generator using the following data:  
Full load output power 1200 kW, armature resistance =  $0.005 \Omega$ , shunt field resistance =  $60 \Omega$ , brush contact drop = 1 V per brush, mechanical and iron losses at rated load = 20 kW, stray load loss = 1.2% of output.

**UNIT – III**

- 5 (a) Derive the expression for voltage regulation of single phase transformer.
- (b) A 10 KVA, 2500 / 250 V, single phase transformer gave the following test results:  
O.C. test: 250 V, 0.8 A, 50 W  
S.C. test: 60 V, 3 A, 45 W  
(i) Calculate the efficiency of half full load at 0.8 p.f.  
(ii) Compute the voltage regulation at 0.8 p.f. leading.

OR

- 6 (a) Deduce the EMF equation of a 3-phase alternator.
- (b) Describe working principle of 3-phase induction motor.

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**PART – B****UNIT – I**

- 7 Explain in detail about the operation of P & N type semiconductors along with the required diagrams.

**OR**

- 8 Illustrate with diagram and discuss about operation of full-wave bridge rectifier.

**UNIT – II**

- 9 Describe in detail about the common collector configuration of bipolar junction transistor and its I/O characteristics.

**OR**

- 10 Explain about the construction and operation of JFET with the essential diagrams.

**UNIT – III**

- 11 What are the conditions for sustained oscillation? Write a brief note on principle and operation of RC phase shift oscillator with necessary circuit.

**OR**

- 12 Discuss in detail about inverting and non-inverting amplifiers with necessary circuit diagrams.

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