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**2007 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

**II B.TECH I SEMESTER REGULAR EXAMINATIONS  
ELECTRICAL AND ELECTRONICS ENGINEERING  
(AUTOMOBILEENGINEERING)**

**SET NO -1  
NOVEMBER 2007**

**Time: 3 hours  
Marks: 80**

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**Answer any FIVE Questions  
All Questions carry equal marks**

1. (a) Define

i. self inductance

ii. mutual inductance and

iii. efficient of coupling.

(b) Two coils of inductances 4 and 6 Henry are connected in parallel. If their mutual inductance is 3 Henry, calculate the equivalent inductance of the combination if

i. Mutual inductance assists the self inductance

ii. Mutual inductance opposes the self inductance

[6+10]

2. (a) Give the applications of self excited generators.

(b) An 8 pole d.c. shunt generator with 778 wave connected armature conductors and running at 500 rpm supplies a load of 12.5 resistance at terminal voltage of 50V. The armature resistance is 0.24 and the field resistance is 250 . Find the armature current, the induced emf and the flux per pole. [6+10]

3. (a) Explain the principle of operation of a Transformer.

(b) "The transformer has very high efficiency compared to any other electrical machine." Explain Why?

(c) A 10 KVA, 440/3300V, single Phase transformer, when tested on open circuit, gave the following figure on the primary side: 440V, 1.3A, and 115W. When tested on short circuit with full load current the power input was 150w Calculate the efficiency of Transformer at

i. Full load UPF and

ii. Half full load at 0.8pf.

[3+3+10]

4. (a) Draw a neat sketch showing the various parts of a Synchronous Generator and Explain each part briefly.

(b) Explain why a 3 Phase induction motor can not run at Synchronous speed.

(c) A 3 Phase 50 Hz slip ring induction motor runs at 290 rpm at full load. Determine

i. the number of poles

ii. the slip at full load and

iii. frequency of rotor currents

5. (a) Discuss the classification of electrical measuring instruments employed for measurement of current.

(b) Explain the significance of controlling torque and damping torque relevant to the Operation of indicating instruments? [6+10]

6. (a) Derive an expression for the efficiency and ripple factor of a half wave rectifier

(b) A half wave rectifier is used to supply 50V dc to a resistive load of 800 ohms. The diode has a resistance of 25 ohms. Calculate ac voltage required.

[8+8]

7. (a) Explain the terms break over voltage, holding current and forward current rating as used in SCR analysis.

(b) An ac amplifier has a voltage gain of 55 and a power gain of 456.5 The ac output current is 24.9mA rms and the ac input resistance is 200 ohms. Find

i. the current gain,

ii. the rms value of the ac input current,

iii. the rms value of the ac input voltage

iv. ac output resistance

[8+8]

8. (a) Why trigger pulse is used in CRO? Give the relationship between the trigger pulse and the sweep in an oscilloscope.

(b) Explain how FET and Bipolar transistors are used as Probe for CRO.