ANNA UNIVERSITY – 2007
B.E/B.TECH III SEMESTER DEGREE EXAMINATION
ELECTRICEL TECHNOLOGY
(MARINE ENGINEERING)

TIME-3HOUR
MARK-100

ANSWER ALL QUESTIONS

PART A (10 X 2 = 20)

1. What are the conditions that must be fulfilled for the machine to self excite?

2. Draw a three point starter and indicate its important components.

3. A slip ring induction motor runs at 285 rpm on full load when fed from a 50 Hz supply. Calculate number of poles and slip.

4. What are the advantages of stationary armature and rotating field in synchrous generator?

5. What type of motor is preferred for traction? Why?

6. Mention the characteristics of motor required for mining application.

7. Name the types of insulators and where they can be used?

8. Draw the layout of transmission and distribution system.

9. Briefly discuss the procedure for determining the size of wire for an internal installation.

10. State any four important Indian electricity rules..

PART B (5 X 16 = 80)

11. (i) Explain the torque-speed characteristics of a three phase slip ring induction motor.

(ii) Three loads , and ohm are connected in delta across a 200 V, 3 phase supply. Find the phase currents, line currents and power.

12. (a) (i) Describe the construction of armature, field and commutator of a d.c. machine.

(ii) Describe Swinburne test on a shunt motor and give the steps for calculating the efficiency of a motor from the results of the test.

Or

(b) (i) Bring out the analogy between electric and magnetic circuits.

(ii) Derive the EMF equation of a d.c. generator.

(iii) A motor develops a torque of 150 N-m. A 10% reduction in the field flux causes a 50% increase in armature current. Find the new value of torque.

13. (a) (i) How will you determine power rating of electric motor for continuous duty and constant load?
(ii) Discuss the requirements of paper machine drive.

Or

(b) (i) Discuss the various classes of duty.

(ii) Determine the one hour rating of a 15 h.p. motor having a heating time constant of 2 hours. The motor attains the temperature of 40?C on continuous run at full load. Assume that the losses are proportional to

the square of the load and the motor is allowed to cool down to the ambient temperature before being loaded again.

14. (a) (i) Draw the schematic diagram of a modern steam power station and explain its operation.

(ii) Explain Kelvin's law for size of conductor for transmission and its limitations.

Or

(b) (i) How will you determine the economic transmission voltage?

(ii) Compare the volume of conductor material required in 2-wire d.c. system with one conductor earthed and three phase a.c. three wire system.

15. (a) (i) Discuss any one type of motor control circuit.

(ii) A lamp has a uniform luminous intensity of 860 candelas in all directions. It is mounted 7 m above ground. Find the illumination at a point on the ground 12 m from the lamp post.

(iii) Mention the general specifications of a generator and a transformer.

Or

(b) (i) Explain laws of illumination.

(ii) Give signs and symbols for ten electrical accessories.