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**Question Paper Code : 51442**

**B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016**

**Third Semester**

**Electronics and Communication Engineering**

**EC 2201/EC 32/EE 1204/080290008/10144 EC 302 – ELECTRICAL ENGINEERING**

**(Regulations 2008/2010)**

**Time : Three Hours**

**Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. Define commutation of a dc machine.
2. What are the parameters that could be found using Brake test and Swinburne's test ?
3. Write down the e.m.f equation of a transformer.
4. Define voltage transformation ratio of transformer.
5. A three-phase 2-pole motor is to have a synchronous speed of 6000 rev/min. Calculate the frequency of the supply voltage.
6. A stator winding supplied from a three - phase 60 Hz system is required to produce a magnetic flux rotating at 900 rev/min. Determine the number of poles.
7. Write the applications of the synchronous motor.
8. Write the emf and mmf equations of the synchronous motor.
9. What is a sub-station ?
10. List down the principle insulating materials used in cables ?

**PART – B (5 × 16 = 80 Marks)**

11. (a) Explain the constructional details and working principle of a d.c. generator and derive the Induced EMF equation.

**OR**

- (b) Explain with a neat sketch, a three-point starter used for a d.c. shunt motor.

12. (a) With a necessary vector diagrams, discuss about transformer on no-load and loaded conditions. **(16)**

**OR**

- (b) (i) Draw the Equivalent circuit of a transformer with all its notations. **(8)**

- (ii) Write a note on open circuit test on transformer. **(8)**

13. (a) (i) Explain about the construction and working operation of three phase induction motor. **(8)**

- (ii) Draw the equivalent circuit and performance calculation of three phase induction motor. **(8)**

**OR**

- (b) (i) Explain about principle and operation of single phase induction motor. **(8)**

- (ii) A 3-phase 400V, star connected induction motor has a star connected rotor with a stator to rotor turn ratio of 6.5. The rotor resistance and standstill reactance per phase are  $0.05\Omega$  and  $0.25\Omega$  respectively. What should be the value of external resistance per phase to be inserted in the rotor circuit to obtain maximum torque at starting and what will be the rotor starting current with this resistance? **(8)**

14. (a) Derive the mechanical power flow within the synchronous motor.

**OR**

- (b) Explain the different torques of a synchronous motor.

15. (a) (i) Explain with a neat diagram, a typical 66/11 kV sub-station. **(10)**

- (ii) Compare the merits and demerits of underground system versus A overhead system. **(6)**

**OR**

- (b) (i) What is electric power supply system? Draw a single line diagram of a typical a.c. power supply scheme. **(8)**

- (ii) Discuss the merits and demerits of EMVAC transmission system. **(8)**