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Question Paper Code : **60442**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Third Semester

Electronics and Communication Engineering

EC 2201/EC 32/EE 1204/10144 EC 302/080290008 — ELECTRICAL ENGINEERING

(Regulations 2008/2010)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the applications of series motor.

2. What is the significance of back emf?

3. Write the parameters referred to HV/LV windings.

4. What are the various losses taking place in a transformer? State the parts of the transformer in which they occur.

5. Draw the equivalent circuit of the induction motor.

6. Give the types of the induction motor.

7. Write down the relation between speed and frequency.

8. Define voltage regulation of an alternator.

9. A Transmission line 5 km long has a characteristic impedance of $800 \underline{|25°}$ Ω. At a particular Frequency the attenuation coefficient of the line is 0.5 Np/km and the phase shift coefficient is 0.25 rad/km. Determine the magnitude and phase of the current at the receiving end, if the sending end voltage is $2.0 \underline{|0°}$ V r.m.s.

10. A Power of 2000MW is to be transmitted from a super thermal Power station in Central India over 800 km to Delhi. Use 400 kV and 800 kV alternatives. Suggest the number of circuits required with 50% series capacitor compensation and calculate the total power toss and loss per km.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss about the principle and operation of DC motor. (8)

    (ii) A DC series motor drives a load, the torque of which varies as the square of the speed. Assuming the magnetic circuits to be remain unsaturated and the motor resistance to be negligible, estimate the percentage reduction in the motor terminal voltage which will reduce the motor speed to half the value it has on full voltage. What is then the percentage fall in the motor current and efficiency? (8)

Or

    (b) (i) Explain about the Armature control method of DC shunt motor. (8)

    (ii) A 6-pole, 500V wave connected shunt motor has 1200 armature conductors and useful flux per pole of 20 mWb. The armature and field resistance are 0.5 a and 250 Ω respectively. What will be the speed and torque developed by motor when it draws 20 amps from the supply mains? Neglect Armature reaction. If magnetic and mechanical losses amount to 900 W, find (1) useful torque (2) output in kW (3) Efficiency. (8)

12. (a) (i) Describe briefly about the open circuit and short circuit test on transformer. (10)

    (ii) What is meant by regulation of a transformer? (6)

Or

    (b) Discuss in detail the constructional details, principle of operation and emf equation of a transformer. (16)

13. (a) Explain the construction and working principle of three phase induction motors? What are its advantages and disadvantages? (16)

Or

    (b) Write short notes on the following :

    (i) Torque developed by an induction motor. (8)

    (ii) Making single phase induction motor self starting. (8)

14. (a) Explain the construction and working principle of an alternator.

Or

    (b) Explain the construction and working principle of a reluctance motor.

15. (a) Explain the design of electric substation.

Or

(b) Explain the limitations of Electric Power Transmission.

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