



Reg. No. :

| | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

Question Paper Code : X 20482

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Third Semester
Electronics and Communication Engineering
EE 6352 – ELECTRICAL ENGINEERING AND INSTRUMENTATION
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Write the working principle of a DC motor.
2. Mention the types of DC series motor.
3. Why transformers are rated in kVA ?
4. Define all day efficiency of a transformer.
5. Mention the characteristic features of synchronous motor.
6. Compare slip ring and squirrel cage type rotor.
7. Define accuracy and precision.
8. Write the working principle of piezoelectric transducer.
9. List the advantages of digital storage oscilloscope.
10. Define resolution of DVM.

PART – B

(5×13=65 Marks)

11. a) i) Draw and explain the construction and principle of a operation of a DC generator. (6)
ii) A motor takes an armature current of 110 A at 480 V. The armature circuit resistance is 0.2 the machine has 6-poles and the armature is lap-connected with 864 conductors. The flux per pole is 0.05 Wb. Calculate :
i) the speed and
ii) the gross torque developed by the armature. (7)

(OR)



- b) i) Draw and explain the characteristic of a DC shunt motor and DC series motor. Compare the DC shunt and series motor characteristics and applications. (6)
- ii) A four-pole generator, having wave-wound armature winding has 51 slots, each slot containing 20 conductors. What will be the voltage generated in the machine when driven at 1500 rpm assuming the flux per pole to be 7.0 mWb ? (7)
12. a) i) A 20 kVA single phase transformer designed for 2000/200 V has the following constant : $R_1 = 2.5 \Omega$, $X_1 = 8 \Omega$, $R_2 = 0.04 \Omega$ and $X_2 = 0.07 \Omega$. Calculate the approximate value of the secondary terminal voltage and % regulation at full load and 0.8 p.f. lagging when primary applied voltage is 2000 V. (7)
- ii) Find “all day” efficiency of a transformer having maximum efficiency of 98% at 15 kVA at unity power factor and loaded as follows :
- 12 hours – 2 kW at 0.5 p.f. lag
 6 hours – 12 kW at 0.8 p.f. lag
 6 hours – at no load. (6)
- (OR)
- b) i) Deduce the equivalent circuit of transformer. (6)
- ii) A 1100/110 V, 22 kVA single phase transformer has primary resistance and reactance 2Ω and 5Ω respectively. The secondary resistance and reactance are 0.02Ω and 0.045Ω respectively. Calculate :
- 1) Equivalent resistance and reactance of secondary referred to primary.
 - 2) Total resistance and reactance referred to primary
 - 3) Equivalent resistance and reactance of primary referred to secondary.
 - 4) Total resistance and reactance referred to secondary.
 - 5) Total copper loss. (7)
13. a) Explain the working principle of a 3 phase induction motor. Hence derive the expression for its torque and obtain the condition for maximum torque. (13)
- (OR)
- b) i) Explain the working principle of a synchronous motor. (6)
- ii) Describe the constructional features of salient pole and smooth cylindrical type rotor of an alternator. (7)
14. a) i) Discuss the causes and method to minimise different types of errors. (6)
- ii) With equivalent circuit, obtain the transfer function of LVDT. (7)

(OR)



- b) i) Write the broad classification of transducers with example for each. (7)
- ii) Describe the working principle of capacitor microphone. (6)
- 15. a) Discuss in detail about any two types of DVM. (13)
- (OR)
- b) i) Derive the balance condition for the low resistance measurement bridge. (10)
- ii) Draw the basic diagram of AC bridge and mention the conditions to be satisfied for AC bridge balance. (3)

PART – C

(1×15=15 Marks)

- 16. a) i) State and derive gauge factor of a strain gauge. (8)
 - ii) Explain the construction and working principle of capacitor microphone. (7)
 - (OR)
 - b) i) Discuss in detail about RVDT. (7)
 - ii) Explain the working principle of Q meter with suitable diagram. (8)
-