BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – Dip.EE-2022
Course Name – Electrical Machine I
Course Code - DEEPC302
(Semester III)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Predict D.C. motor is preferred for elevators
a) Shunt motor b) Series motor
c) Differential compound motor d) Cumulative compound motor

(ii) Estimate to get the speed of D.C, motor below the normal without wastage of electrical energy is used.
a) Ward Leonard control b) rheostatic control
c) any of the above method d) none of the above method

(iii) D.C. motors are widely apply in
a) pumping sets b) air compressors
c) electric traction d) machine shops

(iv) Identify the D.C. motor which will be suitable along with flywheel for intermittent light and heavy loads
a) Series motor b) Shunt motor
c) Cumulatively compounded motor d) Differentially compounded motor

(v) Sparking at the commutator of a D.C. motor may result in
a) damage to commutator segments b) damage to commutator insulation
c) increased power consumption d) all of the above

(vi) Determine transformer cores are built up from laminations rather than from solid metal so that
a) Oil penetrates the core more easily b) Eddy current loss is reduced
c) Less lamination is required for the windings d) Turn ratio is higher than voltage ratio

(vii) Define the Transformer action requires a
a) Constant magnetic flux b) Increasing magnetic flux
c) Alternating magnetic flux d) Alternating electric flux

(viii) Identify voltage equation of a dc motor is
a) V = Eb + IaRa b) Eb = V + IaRa
c) V = Eb/IaRa d) V = Eb + Ia2Ra

(ix) identify from this given below not the basic element of the transformer

c) secondary winding
b) primary winding
d) mutual flux

(x) Determine during short-circuit test, iron losses are negligible because

a) the current on the secondary side is negligible
b) the voltage on the secondary side does not vary
c) the voltage applied on the primary side is low
d) full-load current is not supplied to the transformer.

(xi) Identify which generator has poorest voltage regulation

a) series
b) shunt
c) compound
d) high

(xii) Explain the voltage regulation of an over compound dc generator is always

a) Positive
b) negative
c) zero
d) high

(xiii) Examine Eddy current loss in a transformer varies

a) square of frequency
b) reciprocal of frequency
c) directly with frequency
d) root of square frequency

(xiv) Identify Three point starter used for

a) series motor only
b) shunt motor only
c) compound motor only
d) both shunt and compound motor

(xv) Identify Three point starter used for

a) series motor only
b) shunt motor only
c) compound motor only
d) both shunt and compound motor

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Define a Transformer by the statement. (3)
3. Define Current transformer (3)
4. Identify the materials used in machine manufacturing (3)
5. Explain back emf in d.c motors (3)
6. Explain Why the open circuit test on a transformer is conducted at rated voltage? (3)

OR

Explain the need for parallel operation of the transformer. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Calculate a 480 V, 20kW, shunt motor of rows 2.5A, when running at with light load. Taking the armature resistance to be 0.6Ω, field resistance to be 800 Ω, and brush drops at 2V and calculate full load efficiency. (5)
8. Explain the E.M.F Equation of DC Generator. (5)
9. Describe the main parts of the DC Machine. (5)
10. Explain the effects of armature reaction. (5)
11. What are Interpoles? explain with a diagram. (5)
12. Explain the vector and phasor diagram: I.Yd11 II.Yy6 (5)

OR

Explain the vector and phasor diagram: I.Dd6 II.Dy11 (5)

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