

BOARD DIPLOMA EXAMINATION

APRIL - 2013

C-09-EE-304

AC machines & Batteries

scheme of valuation

part A

1. 1+1+1
2. $1\frac{1}{2} + 1\frac{1}{2}$
3. 1M for each
4. 3M
5. 3M
6. 1M for each
7. $1\frac{1}{2} + 1\frac{1}{2}$
8. 1M for each
9. 1M for each
10. 3M

part B

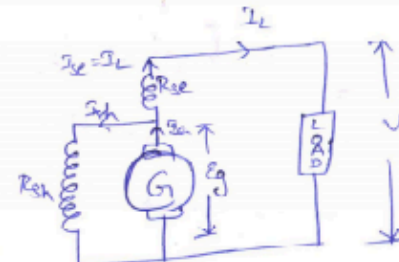
11. 2M for each ($2 \times 4 = 8M$) & process 2M ; Tol - 10M
12. (a) 5M
(b) 5M
13. (a) 5M
(b) 5M
14. (a) 5M
(b) 5M
15. Diagram - 5M
Explanation - 5M
16. Diagram - 5M
Explanation - 5M
17. construction - 5M
charging eq's - $2\frac{1}{2}$
Discharging eq's - $2\frac{1}{2}$
18. (a) 5M
(b) 5M.

1) Ans: DC shunt generator

$$I_a = I_L + I_{sh} \quad (\text{or})$$

$$= I_{se} + I_{sh} \quad (\because I_{se} = I_L)$$

$$V = E_g - I_a R_a - I_{se} R_{se} - I_{sh} R_{sh}$$



2) Ans: Back pitch:

It is defined as the distance in conductors by which a coil advances. And it is denoted by " y_b ".

front pitch:

It is defined as the distance in conductors from the end of first coil to the beginning of the second coil. It is denoted by " y_f ".

3) Ans: Applications of D.C Generators:

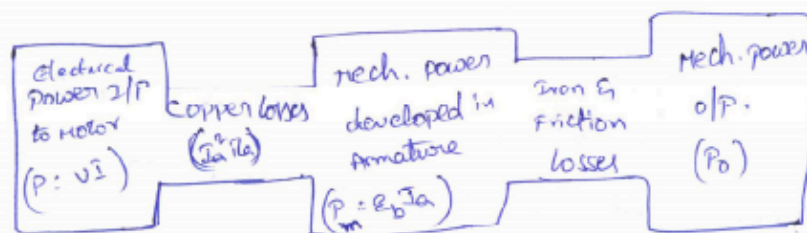
- 1) lighting and power supply
- 2) Battery charging
- 3) Line boosters
- 4) constant terminal voltage requirements
- 5) welding purpose

(2)

4) Ans: commutation:

The process by which current in the short circuited coil is reversed while it crosses the magnetic neutral axis is called commutation.

5) Ans: power flow Diagram of DC Motor:



6) Ans: Applications of DC Motor:

- 1) Electric fan, blowers, pumps
- 2) Milling & lathe machines
- 3) Elevators, small cranes & hoists
- 4) Electric traction
- 5) Paper Mills, Rolling Mills etc.

7) Ans: NVC (No Volt coil):

The function of this coil is to hold the starting arm in full running position. But in case of disconnection of supply (or) break in field circuit it is de-energised & releases the arm & it goes to OFF position.

(3)

OLR (Over load Release)

The OLR consists of an electromagnet connected in the supply line. If the motor becomes overloaded beyond a certain predetermined value, then iron plate is lifted & short circuits the electromagnet. Hence arm released & returns to OFF position.

8) Ans: methods of speed control of DC motor:

- 1) By varying Armature Resistance (R_a)
- 2) By varying Field flux (ϕ)
- 3) By varying terminal voltage

9) Ans: Factors Affecting the capacity of Battery:

- a) Specific gravity
- b) temperature
- c) EMF
- d) Rate of discharge.

10) Trickle charging:

In most of the applications the battery operates intermittently i.e. not continuous. It will be idle for much of the time in a day. During idle period the

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