. : (1) Question No.1 is compulsory.
(2) Answer any **four** out of **remaining** questions.
(3) Assume **suitable** data if **required**.
(4) **Figures** to the **right** indicate **full** marks.

Attempt any **four** :–   **20**

   (a) Explain, the equivalent circuit of an induction motor.

   (b) State the applications of 3-phase squirrel cage and slip-ring induction motor.

   (c) Explain 'V-curves' for synchronous motor.

   (d) Explain the working principle of circuit breaker.

   (e) Universal gates.

(a) Explain the various power stages occuring in 3-ϕ Induction motor.   **10**

(b) Explain the following characteristics for D.C. shunt and series motors –   **10**

     (i) T_a/I_a

     ii) N/I_a

     (iii) N/T_a.

(a) A 250 volt d.c. shunt motor has armature resistance of 0·25 ohm, on load **10** it takes an armature current of 50 Amp. and runs at 750 rpm. If the flux of the motor is reduced by 10% without changing the load torque, find the new speed of the motor.

(b) Explain the working of –   **10**

     (i) 3-point starter

     (ii) 4-point starter.

for operation of D.C. shunt motor.

(a) Explain the working of 1-ϕ shaded pole induction motor.   **·10**

(b) Explain the build up of voltage for D.C. generator.   **10**

(a) Derive the emf equation for a D.C. generator.   **10**

(b) Explain the method of starting for synchronous motor.   **10**

(a) Explain the induction heating and dielectric heating.   **10**

(b) With the help of block diagram, explain the working of CRO. Name the **10** different controls on the front panel of CRO. Give some applications of CRO.

(a) With the help of appropriate waveforms, explain the application of SCR for **10** speed control of –

     (i) 1-ϕ AC motor

     (ii) D.C. series motor.

(b) Draw internal structure of 8085 micro-processor. Also explain different types **10** of registors in it.

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