Roll No. ☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (EE/Electrical & Electronics Engg.) (2012 Onwards)
B.Tech. (Electrical Engineering & Industrial Control/Electronics & Electrical Engg.) (2012 to 2017)   (Sem.–6)

ELECTRIC POWER UTILIZATION
Subject Code : BTEE-601
M.Code : 71147

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Write briefly :

Q1   What are the factors governed in choice of drive?

Q2   Explain continuous rating and short time rating of a motor.

Q3   Enumerate the merits and demerits of shunt transition.

Q4   Explain the terms 'Free Running', 'Coasting' and 'Braking' with reference to electric traction.

Q5   Explain Radiant Heating.

Q6   List the applications of carbon arc welding.

Q7   State the laws of illumination.

Q8   Define Luminous flux and solid angle.

Q9   List the applications of Electrolysis.

Q10   Enumerate different ways of producing refrigeration.

SECTION-B

Q11   Determine the rated current of an electrical machine for the following duty cycle:

600A for 3mins, a sharp increase to 1200A and constant at this value for 1 min, gradually decreasing for 2mins to 240A and constant at this value for 2mins, gradually increasing to 600A during 2mins and the repetition of the cycle.

Q12   Explain in brief the air-conditioning cycle.

Q13   Explain methods of energy storage welding.

Q14   A lamp of 300 candle power, is placed 1.5 m below a reflecting plane mirror surface, which reflects 70% of the light falling on it. Find the illumination at a point 4m.

Q15   Explain how chemicals are manufactured using electrolytic processes?

SECTION-C

Q16   a) A 3-phase, 45kW, 6-pole, 960rpm induction motor has a constant load torque of 270Nm and at wide intervals additional torque of 1350Nm for 10 seconds. Calculate the moment of inertia of the flywheel used for load equalization, if motor toque is not to exceed twice the rated torque.

        b) A 220V shunt motor develops a total torque of 100Nm and takes 31A at 600rpm. The armature and shunt field resistances are 0.3 Ω and 220 Ω respectively. If the speed is to be increased to 800rpm, determine the percentage reduction of the flux and additional resistance to be inserted in the field circuit. Total torque developed at 800 rpm is 70Nm.

        Neglect armature reaction and assume the magnetization curve to be a straight line.

Q17   a) Explain multiple unit control in electric train and explain in details each one of them?

        b) What are different braking systems and explain them in details?

Q18   a) Explain dielectric heating? How is this different?

        b) A laminated plywood board 40cm $\times$ 25 cm $\times$ 1.8 cm is to be heated from 25°C to 160°C in 12 minutes, using 25 MHz supply, specific heat of wood is to be taken as 0.32, density is 0.6 g / cm^3, relative permittivity of wood is 6 and power factor 0.05. Find the supply voltage, power required and current drawn. Take the efficiency of the process as 75%.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.