115. If θ_e be the electrical angle and θ_m be the mechanical angle and P be the number of poles of a synchronous motor, then which one of the following relation is true?
(1) $\theta_e = P \times \theta_m$ (2) $\theta_e = (P/2) \times \theta_m$
(3) $\theta_e = \theta_m / P$ (4) $\theta_e = P/\theta_m$

116. The essential condition for parallel operation of two single phase transformers is that they should have same
(1) Polarity (2) KVA rating (3) Voltage ratio (4) Percentage impedance

117. The V-curve of a synchronous motor is a plot of
(1) State current versus stator power factor
(2) Stator current versus rotor current at all loads
(3) Stator current versus rotor currents when power delivered is constant
(4) Stator current versus power delivered

118. A wound rotor induction motor runs with a slip of 0.03 when developing full load torque. Its rotor resistance is 0.25 ohm per phase. If an external resistance 0.50 ohm per phase is connected across the slip rings, what is the slip for full load torque?
(1) 0.03 (2) 0.06 (3) 0.09 (4) 0.1

119. The torque developed in a three phase induction motor depends on
(1) Stator flux and rotor current (2) stator flux and stator current
(3) stator current and rotor flux (4) rotor current and rotor flux

120. A single phase ac induction motor is not self starting because it has
(1) No slip (2) rotor is short circuited
(3) high intertia (4) absence of rotating magnetic field

121. A single phase winding in a single phase motor produces
(1) an alternating magnetic field (2) a stationary magnetic field
(3) a rotating magnetic field (4) a steady magnetic field

122. Under no-load conditions, power factor of an induction motor is about
(1) 0.2 lag (2) 0.9 lag (3) Unity (4) 0.5 lead

123. Of all the plants, minimum quantity of fuel used is required in ..... plant.
(1) Diesel power (2) Steam (3) Hydro-electric (4) Nuclear

124. The overall efficiency (η) of a Thermal Power Station is
(1) η_{boiler} (2) $\eta_{boiler} \times \eta_{generator}$ (3) $\eta_{generator} \times \eta_{turbine}$ (4) $\eta_{turbine} \times \eta_{boiler}$

125. The effect of water hammer can be minimized by using
(1) Spill way (2) Anvil (3) Surge Tank (4) Draft tube

126. In a diesel power plant suspended impurities in the fuel are removed by
(1) Cyclone separators (2) Electrostatic separators
(3) Fabric filters (4) Strainer

127. The rupturing capacity of a circuit breaker is measured in
(1) Ampere (2) Volt-Ampere (3) Watt (4) Volt

128. A circuit breaker is essentially
(1) An arc extinguisher
(2) A current interrupting device
(3) A power factor correcting device
(4) A device for neutralizing the effect of transients

129. Mho relay normally is used for protection of
(1) Long transmission lines
(2) Medium Transmission lines
(3) Short transmission lines
(4) No length criterion

130. The scheme adopted for bus-bar protection is
(1) spilt-phase protection (2) differential protection
(3) over current protection (4) reverse power protection

131. Due to the ferrari effect on long overhead lines _____
(1) receiving end voltage is less than sending voltage
(2) receiving end voltage is more than sending voltage
(3) receiving end voltage is equal to sending voltage
(4) receiving end voltage is not effected

132. Corona occurs between two transmission lines when they are
(1) closely spaced (2) widely spaced
(3) having high potential difference (4) carrying DC power

133. Surge impedence of a transmission line is given by
(1) $\sqrt{(L/C)}$ (2) $\sqrt{(C/L)}$ (3) $\sqrt{LC}$ (4) $1\sqrt{LC}$

134. The general distance for short transmission line is _____
(1) less than 80 km (2) 80 km-250 km
(3) more than 250 km (4) 150 km-300 km

135. The resistance of the line
(1) increases with increase in frequency (2) decreases with increase in frequency
(3) is independent of frequency (4) increases with decrease in frequency

136. In HVDC Transmission System AC is converted to DC using
(1) Rectifier (2) Inverter (3) Chopper (4) Cycloconverter

137. Suspension type insulators are used for voltages beyond
(1) 220 V (2) 400 V (3) 11 KV (4) 33 KV

138. Power Factor of Industrial loads is generally

(1) Unity (2) Leading (3) Lagging (4) Zero

139. Pole mounted transformer stations are meant for

(1) Primary transmission (2) Primary distribution
(3) Secondary transmission (4) Secondary distribution

140. Transmission lines are transposed to

(1) Reduce copper loss
(2) Reduce skin effect
(3) Prevent interference with communication lines
(4) Present short circuit between conductors

141. The units for specific energy consumption related to traction is _____

(1) $\frac{\text{Watt - Hour}}{\text{Tonne - km}}$ (2) $\frac{\text{Watt - Hour}}{\text{km}}$ (3) Joules/Sec (4) Watt

142. In Kando system of track electrification_____ is converted into _____

(1) single phase, dc (2) dc, single phase
(3) single phase, three phase (4) three phase, single phase

143. A train has a scheduled speed of 60 kmph between the stops which are 6 km apart. The actual run time is _____ if the duration of stop is 60 sec.

(1) 60 sec (2) 360 sec (3) 240 sec (4) 300 sec

144. Average speed of a train is dependent on

(1) Distance between two stops & run time
(2) Run time & stop time
(3) Stop time & acceleration
(4) Acceleration & deceleration

145. The electric motor used for traction work should have _____
(1) Low starting torque (2) High starting torque
(3) Rise in speed with increase in load (4) No braking capability

146. Tractive effort of an electric locomotive can be increased by
(1) Increasing the supply voltage
(2) Increasing the speed
(3) Increasing the dead weight over the driving axles
(4) Using high rating motors

147. Tractive effort required for a train going down from an upgradiant is
(1) less than tractive effort on level track
(2) more than tractive effort on level track
(3) equal to the tractive effort on level track
(4) independent of mass of the train

148. The area under speed-time curve of a train represents
(1) average speed (2) average acceleration
(3) distance travelled (4) average velocity

149. As the number of wire guage increases the cross sectional area of wire _____
(1) increases (2) remains same
(3) becomes neglible (4) decreases

150. Which of the following wiring is not visible outside?
(1) conduit wiring (2) cleat wiring
(3) casing and capping wiring (4) concealed wiring

151. Resistance of earth system of power stations should not exceed the limit of -----
(1) 0.5 ohms (2) 2 ohms (3) 1 ohms (4) 5 ohms

152. In electrical installations the fuse is always connected in _____ wire.
(1) earth (2) neutral (3) phase (4) ground

153. The transistor used in amplifier circuits operates in
(1) Active region (2) Saturation region
(3) Cut off region (4) Reverse region

154. The gain of an amplifier is given by the following formula
(1) $G(dB) = 10 \log (p_{in}/p_{out})$ (2) $G(dB) = 10 \log (p_{out})$
(3) $G(dB) = 10 \log (p_{out}/p_{in})$ (4) $G(dB) = 10 \log (p_{in})$

155. The number of diodes that are used in half wave rectifier and full wave bridge rectifier are
(1) 1,2 (2) 1,4 (3) 2,4 (4) 2,1

156. The average voltage of a full wave rectifier fed from an ac source of peak voltage, V_m and frequency 50Hz is
(1) V_m/π (2) $2V_m/\pi$ (3) $V_m/\sqrt{2}$ (4) $V_m/2$

157. In a transistor which of the following layer is lightly doped
(1) Emitter (2) Collector (3) Drain (4) Base

158. Zener diode regulates
(1) Voltage (2) Current (3) Resistance (4) Power

159. The frequency of oscillation of wein bridge oscillator in Hz is
(1) $1/2\,\pi\,RC$ (2) $2\,\pi\,RC$ (3) $1/RC$ (4) R/C

160. $XYZ+(\overline{X}+\overline{YZ})XYZ+\overline{XYZ}$
(1) XYZ (2) X (3) Z (4) 0

Set Code : T2
Booklet Code : B

161. The 2's complement of the number 1001 1100 is
(1) 0110 0011 (2) 0110 0100 (3) 1001 1100 (4) 1001 1101

162. The bolean expression for NOR gate with inputs A and B is
(1) A+B (2) AB (3) A+B (4) $\overline{A+B}$

163. A DAC with 8 input bits has _____ resolution compared with DAC with 4 input bits.
(1) High (2) Same (3) Low (4) Infinite

164. The power electronic device, Silicon Controlled Rectifier has
(1) Two junctions and three layers (2) Three junctions and three layers
(3) Three junctions and four layers (4) Two junctions and two layers

165. Which one of the following is a bidirectional Controlled switch
(1) Thyristor (2) Triac (3) GTO (4) Diac

166. If the gate current of an SCR is increased, its forward break over voltage V_{BO} will
(1) Increase (2) Decrease (3) Not be affected (4) Be infinity

167. In an UJT triggering circuit for SCR, pulses are generated at _____ of UJT.
(1) Emitter (E) (2) Base 1 (B1) (3) Base 2(B2) (4) B1-B2

168. In a half wave controlled rectifier feeding R-L load, the range of firing angle of thyristor is
(1) $0 \le \alpha \le 180°$ (2) $90 \le \alpha \le 180°$ (3) $0 \le \alpha \le 90°$ (4) $0 \le \alpha \le 360°$

169. The DC output voltage, V_o of a basic chopper circuit with input voltage, V_{in} and duty cycle, δ is given by _____
(1) $V_o = V_{in} \times \delta$ (2) $V_o = V_{in}/\delta$ (3) $V_o = V_{in}/(1-\delta)$ (4) $V_o = V_{in}$

170. An AC regulator provides
(1) Variable frequency, fixed magnitudeAC
(2) Fixed frequency, variable magnitude AC
(3) Fixed frequency, fixed magnitude AC
(4) Variable frequency, variable magnitude AC

171. The output voltage of a single phase bridge inverter is
(1) Square wave (2) Sinusoidal wave
(3) Constant dc (4) Triangular wave

172. Two quadrant operation of dc motor can be obtained if it is fed from a
(1) Uncontrolled convertor (2) Half controlled convertor
(3) Half wave convertor (4) Fully controlled convertor

173. For controlling the speed of a 3 phase induction motor V/f ratio is maintained constant for
(1) Constant air gap flux (2) Constant reactance
(3) Varying the air gap flux (4) Variable resistance

174. 8051 microcontroller has _____ data lines and _____ address lines.
(1) 16, 8 (2) 8, 8 (3) 8, 16 (4) 16, 20

175. Which of the following instruction is not a data transfer instruction?
(1) XCH (2) PUSH (3) ADD (4) MOV

176. Internal memory of 8051 micro controller consists of
(1) 128 bytes of RAM, 2 K bytes of ROM
(2) 4 K bytes of RAM, 128 bytes of ROM
(3) 2 K bytes of RAM, 128 bytes of ROM
(4) 128 bytes of RAM, 4 K bytes of ROM

177. The highest priority interrupt is

(1) TF1 (2) IE1 (3) TF0 (4) IE0

178. Percentage Voltage regulation of a transmission line is given by _____

(1) $(E_s - E_r)/E_r * 100$ (2) $(E_r - E_s)/E_r * 100$

(3) $(E_s - E_r)/E_s * 100$ (4) $(E_r - E_s)/E_s * 100$

179. In a main line service of electric traction system _____

(1) Distance between two stops is very small

(2) Acceleration and retardation periods are small

(3) Free running and coasting periods are short

(4) Acceleration and retardation periods are long

180. For SCR, dv/dt protection is achieved by connecting _____

(1) L in series with SCR (2) RL in series with SCR

(3) RC in series with SCR (4) RC in parallel with SCR

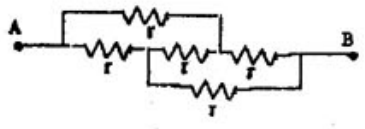
181. The effective resistance between terminals A and B in the below figure is

(1) r

(2) 2r

(3) 3r

(4) 4r



182. If I be the current, C be the capacitance and V be the potential differences, the I/CV will have the unit of

(1) Time (2) Power (3) Frequency (4) Reactive Power

183. In a series R-C circuit excited by a DC voltage E, the initial current is

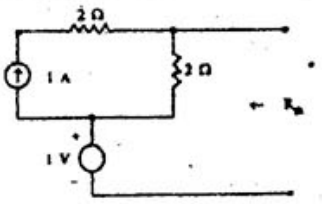
(1) $\frac{E}{R}$ (2) 0 (3) $\frac{E}{C}$ (4) $\frac{C}{E}$

184. The strength of electromagnet can be increased by
(1) Decreasing the length of the conductor (2) Increasing the length of the conductor
(3) Increasing the number of turns (4) Decreasing the number of turns

185. Tesla is a unit of
(1) Flux (2) Field strength (3) Current (4) Flux density

186. According to joule's law heat produced by an electric current is proportional to
(1) square of the resistance (2) square of the current
(3) potential difference (4) square of the time

187. The Thevenin's equivalent resistance R_{th} for given below network is
(1) 1 Ω
(2) 2 Ω
(3) 4 Ω
(4) Infinity



188. In a differential compound generator, the series field turns are provided on
(1) Armature (2) Commutator (3) Interpole (4) Main pole

189. The function of the commutator in a dc machine is
(1) to change alternating current to direct current
(2) to improve commutation
(3) for easy speed control
(4) to change alternating voltage to direct voltage

190. If N is the speed and P is number of poles, then the frequency of induced e.m.f in DC generator will be
(1) $\frac{NP}{60}$ (2) $\frac{NP}{120}$ (3) $\frac{NP}{2}$ (4) NP

191. The demagnetizing flux in dc generator
(1) Increases e.m.f (2) Decreases e.m.f
(3) Increases speed (4) Decreases speed

192. If T_a be the torque and I_a the armature current for a dc series motor, then which of the following relation is valid before saturation
(1) $T_a \alpha I_a$ (2) $T_a \alpha (1/I_a)$ (3) $T_a \alpha (I_a^2)$ (4) $T_a \alpha (1/I_a)^2)$

193. What will happen if the back e.m.f of a DC motor vanishes suddenly
(1) The motor will stop (2) The motor will continue to run
(3) The armature may burn (4) The motor will run noisy

194. The mechanical power developed by a DC motor is equal to
(1) Power input + losses (2) Back e.m.f × armature current
(3) Power output × losses (4) Power output × efficiency

195. Neglecting saturation, if current taken by a series motor is increased from 10A to 12A, the percentage increase in its torque is
(1) 20% (2) 44% (3) 30.5% (4) 16.6%

196. Dynamometer type instrument have
(1) Cramped scale at the beginning (2) Cramped at the end
(3) Cramped at the middle (4) Uniform scale

197. To measure a signal of 10 mV at 75 Hz, which one of the following instrument can be used
(1) cathode ray oscilloscope (2) VTVM
(3) Moving Iron voltmeter (4) digital multimeter

198. Which one of the following a passive transducer
(1) piezolectric (2) thermocouple (3) photovoltaic cell (4) LVDT

Set Code : T2

Booklet Code : B

199. The voltage coil of a single phase house energy meter

(1) is highly resistive

(2) is highly inductive

(3) is highly capacitive

(4) has a phase angle equal to load power factor angle

200. The effective value of a triangular wave is

(1) Max. value

(2) $\sqrt{3}$(Max. value)

(3) $\frac{\sqrt{3}}{\text{Max. value}}$

(4) $\frac{\text{Max. value}}{\sqrt{3}}$