

1-7-12  
4/2011 to 31/2011  
EEA/502

2012

Series

C

4/2011 to 31/2011  
Dec 1-7-12

**ELECTRICAL ENGINEERING  
Paper II**

Time : 150 Minutes

Max. Marks : 150

**INSTRUCTIONS**

1. Please check the Test Booklet and ensure that it contains all the questions. If you find any defect in the Test Booklet or Answer Sheet, please get it replaced immediately.
2. The Test Booklet contains **150** questions. Each question carries **one** mark.
3. The Test Booklet is printed in four (4) Series, viz. **A B C D**. The Series, **A** or **B** or **C** or **D** is printed on the right-hand corner of the cover page of the Test Booklet. Mark your Test Booklet Series **A** or **B** or **C** or **D** in Part C on side 1 of the Answer Sheet by darkening the appropriate circle with Blue/Black Ball point pen.

Example to fill up the Booklet Series

If your Test Booklet Series is **A**, please fill as shown below :



*If you have not marked the Test Booklet Series at Part C of side 1 of the Answer Sheet or marked in a way that it leads to discrepancy in determining the exact Test Booklet Series, then, in all such cases, your Answer Sheet will be invalidated without any further notice. No correspondence will be entertained in the matter.*

4. Each question is followed by 4 answer choices. Of these, you have to select one correct answer and mark it on the Answer Sheet by darkening the appropriate circle for the question. If more than one circle is darkened, the answer will not be valued at all. Use Blue/Black Ball point pen to make heavy black marks to fill the circle completely. Make **no** other stray marks.

e.g. : If the answer for Question No. 1 is Answer choice (2), it should be marked as follows :







1. The essential condition for parallel operation of two dc generators is they have the same
  - (1) kW rating
  - (2) terminal voltage
  - (3) operating speed
  - (4) All of these
  
2. A dc motor delivering constant power output initially operates at 1500 rpm with torque delivered as 200 Nm. The torque delivered at 1200 rpm is
  - (1) 160 Nm
  - (2) 200 Nm
  - (3) 230 Nm
  - (4) 250 Nm
  
3. The  $T_d$  vs  $I_a$  characteristic of a dc series motor is a
  - (1) straight line throughout
  - (2) parabola throughout
  - (3) straight line from no-load to certain load and parabola thereafter
  - (4) parabola from no-load to certain load and straight line thereafter
  
4. The Laplace inverse of  $s/(s + 2)$  is given by
  - (1)  $u(t) + 2e^{-2t} u(t)$
  - (2)  $\delta(t) + 2e^{-2t} u(t)$
  - (3)  $\delta(t) - e^{-2t} u(t)$
  - (4)  $u(t) - e^{-2t} u(t)$
  
5. If current flowing in a lamp drops by 1 percent, the power will be decreased by
  - (1) 2%
  - (2) 4%
  - (3) 0.1%
  - (4) 1%
  
6. The most suitable material for transformer core is
  - (1) hot rolled grain oriented steel
  - (2) cold rolled grain oriented steel
  - (3) aluminium
  - (4) copper
  
7. In cascade operation of two induction motors, the ratio of mechanical power developed and electrical power in the rotor of the main induction motor having  $P_1$  number of stator poles will be
  - (1)  $P_1/P_2$
  - (2)  $P_2/P_1$
  - (3)  $(P_1 + P_2)/P_2$
  - (4)  $(P_1 - P_2)/P_2$
  
8. The thickness of stator laminations is of the order of
  - (1) 0.5 mm
  - (2) 1 mm
  - (3) 0.05 mm
  - (4) None of these
  
9. In large capacity transformers, 5% of the turns at the end of hv winding are provided with extra insulation so as to provide protection
  - (1) against corona
  - (2) against lightning
  - (3) due to surges occurring during switching operation
  - (4) All of these

10. The current flowing in an inductive circuit consisting of a resistance and an inductance is expressed by  $i = I_m \sin \omega t$ . The expression for the applied voltage will be
- (1)  $v = V_m \sin (\omega t + \phi)$
  - (2)  $v = V_m \sin (\omega t - \phi)$
  - (3)  $v = V_m \sin \omega t$
  - (4)  $v = V_m \sin (\omega t - \pi/2)$
11. Varley loop tests are preferred over Murray loop tests because
- (1) Varley loop test can locate open circuit fault
  - (2) Varley loop test gives higher accuracy
  - (3) in Varley loop test provision is made for the measurement of total loop resistance instead of obtaining it from the relation  $R = \rho l/a$
  - (4) Varley loop test can locate the earth fault
12. For applications requiring speed ratio other than 2 : 1, the speed control of an induction motor can be effected by varying the number of stator poles employing
- (1) multiple stator winding
  - (2) pole amplitude modulation technique
  - (3) consequent pole technique
  - (4) Any of these
13. In 3-phase induction motors, speeds higher than synchronous speed can be had by
- (1) line voltage control
  - (2) rotor slip power control
  - (3) rotor resistance control
  - (4) frequency control
14. The method of speed control used for increasing the speed of a dc shunt motor above its rated speed is
- (1) armature resistance control
  - (2) field control
  - (3) armature voltage control
  - (4) series parallel control
15. If  $N$  is the speed, then the windage loss in dc motor is proportional to
- (1)  $N^{0.5}$
  - (2)  $N^{1.0}$
  - (3)  $N^{1.5}$
  - (4)  $N^{2.0}$
16. If  $R_{t2}$ ,  $X_{t2}$  are the total resistance and reactance of the transformer referred to secondary,  $I_2$  is the secondary load current and  $\cos \phi_2$  is the leading pf, then equation for rise in voltage when load is thrown off is
- (1)  $I_2 R_{t2} \cos \phi_2 - I_2 X_{t2} \sin \phi_2$
  - (2)  $I_2 R_{t2} \cos \phi_2 + I_2 X_{t2} \sin \phi_2$
  - (3)  $I_2 R_{t2} \sin \phi_2 - I_2 X_{t2} \cos \phi_2$
  - (4)  $I_2 R_{t2} \sin \phi_2 + I_2 X_{t2} \cos \phi_2$

