Register Number:……..

KUMARAGURU
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GENERAL INSTRUCTIONS TO THE CANDIDATES

1. Candidates are instructed to answer the questions as per Bloom's Taxonomy knowledge level (K_1 to K_6)
2. Candidates are strictly instructed not to write anything in the question paper other than their roll number.
3. Candidates should search their pockets, desks and benches and handover to the Hall Superintendent/ Invigilator if any paper, book or note which they may find therein as soon as they enter the examination hall.
4. Candidates are not permitted to bring electronic watches with memory, laptop computers, personal systems, walkie-talkie sets, paging devices, mobile phones, cameras, recording systems or any other gadget / device /object that would be of unfair assistance to him / her.
5. Corrective measures as per KCT examination policies will be imposed for malpractice in the hall like copying from any papers, books or notes and attempting to elicit the answer from neighbours.

B.E/B.TECH DEGREE EXAMINATIONS: DEC 2015

(Regulation 2014)

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U14EIT304**:** Electrical Machines and Control Devices

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 1 = 10 Marks)

1. For a level compounded DC generator to run at constant speed, the series field mmf must effectively compensate- CO1 [K_2]

   1. Armature reaction mmf
   2. Armature resistance voltage drop
   3. Brush contact voltage drop

   Of these statements regarding interpole used in DC motors, the correct statement(s)is/are

   a) Only 2 b) 1 and 2

   c) 1 and 3 d) 1,2 and 3

2. A coupling magnetic field must react with CO1 [K_1]

   (i) electrical system in order to extract energy from mechanical system

(ii) mechanical system in order to extract energy from mechanical system
(iii) electrical system in order to extract energy from electrical system
(iv) mechanical system in order to extract energy from electrical system
(v) electrical or mechanical system for electro-mechanical energy conversion

From the above, the correct statements are

a) (ii), (iii) & (v)
b) (i), (ii) & (iii)
c) (ii), (iii) & (iv)
d) (ii), (iii) & (v)

3. A 100KVA, 6600/400 V, 50Hz single phase transformer has 80 turns on low voltage side. At 25Hz its flux increases by 10%.The high voltage is CO3 [K_2]

a) 3630V
b) 6600V
c) 7260V
d) 3300V

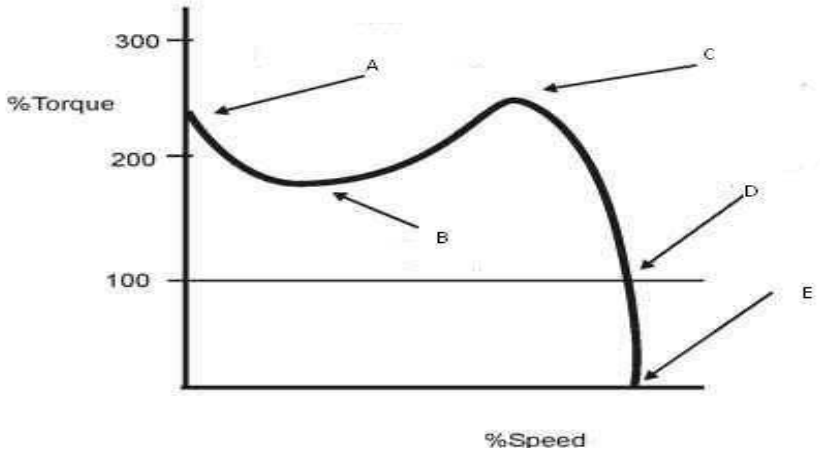
4. As the load on the transformer is increased, the core losses CO3 [K_2]

a) Decrease slightly
b) Increase slightly
c) Remain constant
d) May decrease or increase slightly depending upon the nature of load

5. Burden of a protective relay is the power CO4 [K_2]

a) required to operate the circuit breaker
b) absorbed by the circuit of relay
c) developed by the relay circuit
d) Transformer winding damaged

6. CO2 [K_2]



Arrange the below sequence from 1-5 by referring the various points A-E given in above characteristic of an induction motor

1. Pull up torque 2.Break away torque 3. Synchronous speed 4. Break down torque 5. Rated load torque

a) A=3, B=4, C=1, D=2, E=5 b) A=4, B=2, C=1, D=5, E=3

c) A=1, B=4, C=2, D=5, E=3 d) A=2, B=1, C=4, D=5, E=3

7. Fault diverters are basically CO4 [K_1]

a) fuses b) relays

c) fast switches d) circuit breakers

8. **Assertion(A):** Star-delta starters are majorly used in the split-phase induction motor CO2 [K_2]
Reason(R): Star delta starter of an induction motor applies reduced voltage to stator

a) Both A & R are individually true and R is correct explanation of A b) Both A & R are individually true and R is not correct explanation of A

c) A is true , R is false d) A is false, R is true

9. Which motor is used in escalator? CO5 [K_2]

a) Single phase induction motor b) Three phase induction motor

c) Synchronous motor d) Universal motor

10. Match the different motors in with its suitable applications CO5 [K_2]

Motor	Application
A. Split phase Induction Motor	i. Water Pumping Application
B. Capacitor start Induction Motor	ii. Toys and hair driers
C. Squirrel Cage Induction Motor	iii. Washing Machine
D. Shaded Pole Induction Motor	iv. Industrial Applications

	A	B	C	D
a)	iv	ii	iii	i
b)	ii	iii	iv	i
c)	iii	i	iv	ii
d)	iv	iii	ii	i

PART B (10 x 2 = 20 Marks)
(Answer not more than 40 words)

11. What is the function of no-voltage release coil in DC motor starter? CO2 [K_2]

12. List few applications of permanent magnet motors. CO5 [K_2]

13. Why the slots on the induction motors are usually skewed? CO2 [K_2]

14.	Explain the double revolving field theory.	CO2	[K_1]
15.	Give the reasons for indicating transformer rating in KVA.	CO3	[K_2]
16.	How hysteresis and eddy current losses are minimized in transformer?	CO3	[K_2]
17.	Categorize the different types of switches.	CO4	[K_2]
18.	Differentiate electromechanical relay with solid state relay.	CO4	[K_2]
19.	Define the term Step angle in stepper motor.	CO5	[K_1]
20.	Explain the working principle of Variable Frequency Drives.	CO5	[K_1]

Answer any FIVE Questions:-
PART C (5 x 14 = 70 Marks)
(Answer not more than 300 words)

Q.No. 21 is Compulsory

21.	Describe the construction details of a transformer and categorize the losses that occurs in it.	CO3	[K_2]
22.	Analyze the various characteristics of DC motors and state their applications.	CO2	[K_2]
23.	Discuss the working principle and speed control methods employed in a DC shunt motor.	CO1	[K_2]
24.	With neat sketch explain the various speed control methods for induction motors.	CO2	[K_3]
25.	Explain the construction and working of over current relay and discuss the general selection criteria for a relay.	CO4	[K_2]
26.	Describe about the working of reluctance motor and AC series motor with its applications.	CO5	[K_1]

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