Course/Branch : B.E., /EEE	**Year / Semester** : II/III	Format No.	NAC/TLP-07a.13
Subject Code :EE8301	**Subject Name** : Electrical Machines I	Rev. No.	02
Unit No : III	**Unit Name : Electro Mechanical Energy Conversion and Concepts in Rotating Machines**	Date	30.09.2020

OBJECTIVE TYPE QUESTION BANK

S. No.	Objective Questions (MCQ /True or False / Fill up with Choices)	BTL
1	An electro-mechanical energy conversion device is one which converts _____ a) Electrical energy to mechanical energy only b) Mechanical energy to electrical energy only **c) Electrical to mechanical and mechanical to electrical** d) None of the mentioned	L1
2	What is the coupling field used between the electrical and mechanical systems in energy conversion devices? a) Magnetic field b) Electric field c) **Magnetic field or Electric field** d) None of the mentioned	L3
3	The energy storing capacity of magnetic field is about _____ times greater than that of electric field. a) 50,000 **b) 25,000** c) 10,000 d) 40,000	L2
4	The formula for energy stored in the mechanical system of linear motion type is _____ a) 1/2 Jw_r^2 **b) 1/2 mv^2** c) 1/2 mv d) Jw_r^2	L4
5	The developed electromagnetic force and/or torque in electromechanical energy conversion system, acts in such a direction that tends to _____ a) increase the stored energy at constant mmf **b) decrease the stored energy at constant mmf** c) decrease the co-energy at constant mmf d) increase the stored energy at constant flux	L2
6	A physical system of electromechanical energy conversion, consists of a stationary part creating a magnetic field with electric energy input, and a moving part giving mechanical energy output. If the movable part is kept fixed, the entire electrical energy input will be _____ **a) stored in the magnetic field** b) stored in the electric field c) divided equally between the magnetic and electric fields d) zero	L1

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7	Which of the following statements is/are correct regarding the generation of EMF in rotating electrical machines in the armature winding? EMF is generated _____ a) by rotating armature windings through a magnetic field b) by rotating magnetic field with respect to the armature windings c) by designing the magnetic circuit to have variable reluctance with rotor rotation **d) all of the mentioned**	L1
8	The EMF equation $e = N\omega_r\Phi\sin\omega_r t$ is applicable to _____ a) AC systems with time variant field flux b) DC systems with time variant field flux **c) Both AC and DC systems with time invariant field flux** d) Both AC and DC systems with time variant field flux	L3
9	In the equation for RMS value of the generated EMF in a full pitched coil of an AC machine, $E = E_{max}/\sqrt{2} = \sqrt{2}\pi f_r N\Phi$, f_r depends on _____ a) rotating speed of the armature coil b) rotating speed of the flux density wave **c) relative velocity between the flux density wave and armature coil** d) all of the mentioned	L2
10	In AC rotating machines, the generated or speed EMF _____ a) leads Φ by 90° **b) lags Φ by 90°** c) is in phase with working flux d) lags Φ by 180°	L4
11	In a short pitched coil, the coil pitch factor k_p, is given by _____ a) $k_p = \cos\varepsilon$ **b) $k_p = \cos\varepsilon/2$** c) $k_p = \sqrt{2}\pi f_r N\Phi\cos\varepsilon$ d) $k_p = \cos\varepsilon/2\cos\omega_r t$	L2
12	Which of the following equations represents the RMS value of the generated EMF in a short-pitched N-turn armature coil of an AC machine _____ **a) $E = \sqrt{2}\pi k_p f_r N\Phi$** b) $E = 2\pi k_p f_r N\Phi$ c) $E = N\Phi\omega_r k_p \sin\omega_r t$ d) None of the mentioned	L1
13	The effect of short pitched coil on the generated EMF is _____ a) increasing **b) decreasing**	L1

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	c) either increasing or decreasing d) none of the mentioned	
14	In an AC machine, the effect of distributing the turns in different slots, results in a further reduction of generated EMF by the factor k_d. This factor is called _____ **a) distribution/speed factor** b) coil pitch factor c) winding factor d) all of the mentioned	L3
15	A polyphase induction motor of the slip ring or wound rotor type can be used _____ a) for high start-up torque applications b) as a frequency converter **c) any of the mentioned** d) none of the mentioned	L2
16	The equation for slip speed is _____ a) $(\omega-\omega_r)/\omega$ **b) $\omega-\omega_r$** c) $(\omega_r-\omega)/\omega$ d) ω_r	L4
17	If the rotor of an induction motor is made to revolve in a direction opposite to the rotating flux wave, then RMS value of EMF induced in one phase of rotor E is proportional to _____ **a) 2-s** b) s c) 1-s d) 2+s	L2
18	In an alternator, frequency per revolution is equal to _____ a) number of poles b) twice the number of poles c) speed in rps **d) number of pole-pairs**	L1
19	**What is the coupling field used between the electrical and mechanical systems in energy conversion devices?** (A) Magnetic field (B) Electric field **(C) Magnetic field or Electric field** (D) None of the mentioned	L1

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20	**The energy storing capacity of the magnetic field is about _____ times greater than that of the electric field.** (A) 50,000 **(B) 25,000** (C) 10,000 (D) 40,000	L3
21	**All practical electromechanical energy conversion devices make use of the magnetic field rather than the electric field as the coupling medium.This is because** (A) electric field systems present insulation difficulties (B) electric field systems have more dielectric loss than the magnetic loss, for the same power rating of the machine (C) in electric field systems, for normal electric field strength, the stored energy density is high **(D) in magnetic field systems, for normal magnetic flux density, the stored energy density is high**	L2
22	**The developed electromagnetic force and/or torque in electromechanical energy conversion system acts in such a direction that tends to _____** (A) increase the stored energy at constant mmf **(B) decrease the stored energy at constant mmf** (C) decrease the co-energy at constant mmf (D) increase the stored energy at constant flux	L4