25ELU205

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2026
(Second Semester)

Branch - **ELECTRONICS**

ELECTRIC MACHINES & INSTRUMENTS

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	The main function of a yoke in a DC generator is: (i)Increase voltage (ii) Provide mechanical support and magnetic path (iii) Reduce losses (iv) Increase speed	K1	CO1
	2	The pole shoes are used to: (i) Increase resistance (ii) Reduce speed (iii) Spread magnetic flux (iv) Increase losses	K2	CO1
2	3	Back EMF in a DC motor opposes: (i) Load (ii) Supply voltage (iii) Current (iv) Speed	K1	CO2
	4	The rotor in an induction motor rotates at: (i) Synchronous speed (ii) Greater than synchronous speed (iii) Less than synchronous speed (iv) Zero speed	K2	CO2
3	5	Atransformer works on the principle of: (i) Self induction (ii) Mutual induction (iii) Capacitance (iv) Resistance	K1	CO3
	6	Asolenoid valve operates using: (i) Hydraulic pressure (ii) Magnetic field (iii) Heat energy (iv) Light energy	K2	CO3
4	7	Agalvanometer can be converted into an ammeter by connecting (i) High resistance in series (ii) Low resistance in parallel (iii) Capacitor (iv) Inductor	K1	CO4
	8	In a series type ohmmeter, the resistance is measured by: (i) Voltage drop (ii) Current variation (iii) Power loss (iv) Frequency	K2	CO4
5	9	The main advantage of DSO over CRO is: (i) Larger size (ii) Signal storage (iii) More noise (iv) Less accuracy	K1	CO5
	10	Phase difference in a digital phase meter is measured in: (i) Volts (ii) Amperes (iii) Degrees (iv) Watts	K2	CO5

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SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the general principles of a DC generator with a neat diagram	K2	CO1
		(OR)		
	11.b.	Derive the EMF equation of a DC generator		
2	12.a.	Explain the working principle of a stepper motor	K2	CO2
		(OR)		
	12.b.	Describe the construction and working of a three-phase induction motor		
3	13.a.	Apply the concept of voltage transformation ratio	K3	CO3
		(OR)		
	13.b.	Examine the construction of an electromagnetic relay.		
4	14.a.	Describe the working of D'Arsonval movement	K4	CO4
		(OR)		
	14.b.	Differentiate between series and shunt type ohmmeter		
5	15.a.	Explain the construction and working of a Digital Storage Oscilloscope (DSO)	K4	CO5
		(OR)		
	15.b.	Analyze the function of a digital tachometer		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Discuss the working operation of a DC generator and illustrate how electrical energy is generated from mechanical energy	K3	CO1
2	17	Analyze the relationship between torque, speed, and flux in a DC motor.	K4	CO2
3	18	Derive the EMF equation of a transformer and interpret the significance of each parameter.	K4	CO3
4	19	Discuss the advantages and disadvantages of analog instruments over digital instruments	K4	CO4
5	20	Explain the working principle of a digital multimeter and illustrate its various measurement functions.	K5	CO5

Z-Z-Z END