

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/5	
Branch	Electrical & Electronics Engineering			Semester	4	
Course Code	401	Paper code		Subject	Rotating AC Machines	
Course Outcome 1		Estimate the performance of three phase induction motor.			Teach Hrs	Marks
Learning Outcome E0540111		Explain constructional features and working of three phase induction motor. (Cognitive domain)			6	8
Contents		<ul style="list-style-type: none"> • Concept of rotating magnetic field • Construction: parts, materials and their functions • Types of three phase induction motor • Working principle of three phase induction motor • Concept of slip and rotor frequency 				
Method of Assessment		<i>Internal : Mid Semester Test 1 – Pen Paper test and Assignment</i>				
Learning Outcome E0540112		Analyze performance of three phase induction motor. (Cognitive domain)			10	12
Contents		<ul style="list-style-type: none"> • Comparison of three phase induction motor with transformer • Equivalent circuit of three phase induction motor • Power stages in three phase induction motor • Torque equation and torque – slip / speed characteristics • Condition for maximum torque under starting and running condition • Methods of braking • Methods of speed control : <ul style="list-style-type: none"> (i) Rotor resistance control (ii) Voltage control (iii) V / f control • Applications of three phase induction motor 				
Method of Assessment		<i>External: End Semester Theory Exam – Pen Paper test.</i>				
Learning Outcome E0540113		Calculate losses and efficiency of three phase induction motor.			2+4	8

	(Cognitive domain)		
Contents	<ul style="list-style-type: none"> • Losses and efficiency of three phase induction motor • Numericals 		
Method of Assessment	<i>External: End Semester Theory Exam – Pen Paper test.</i>		
Learning Outcome E0540114	Demonstrate starters and conduct various tests on three phase induction motor. (Psychomotor and affective domain)	10	12
Contents	<ul style="list-style-type: none"> • DOL, Star / Delta and Rotor resistance starters • Perform No -load test and Block rotor test on three phase induction motor 		
Method of Assessment	<i>External: End semester practical Exam-Performance of Task & viva voce</i>		
Course Outcome-2	Select appropriate single phase motor for given applications.		
Learning Outcome E0540125	Explain working principle and starting methods of single phase induction motor. (Cognitive domain)	6	8
Contents	<ul style="list-style-type: none"> • Double revolving field theory • Methods of making single phase induction motor self starting • Torque – slip characteristic of single phase induction motor • Classification of single phase induction motors • Split phase motor – Resistance start motor, Capacitor start motor, Capacitor start & run motor • Shaded pole motor 		
Method of Assessment	<i>External: End Semester Theory Exam – Pen Paper test</i>		
Learning Outcome E0540126	Select single phase motors for various applications. (Cognitive domain)	6	7
Contents	<ul style="list-style-type: none"> • Working principle and applications of : <ul style="list-style-type: none"> (i) Reluctance Motor (ii) Hysteresis Motor (iii) Universal Motor (iv) AC Series Motor 		
Method of Assessment	<i>Internal: Mid Semester Test -I– Pen paper test & Assignment</i>		

Learning Outcome E0540127	Demonstrate single phase induction motors and Universal motor. (Psychomotor & affective domain)	8	10
Contents	<ul style="list-style-type: none"> • Single phase induction motors • Universal motor 		
Method of Assessment	Internal: performance of task, observation & viva voce		
Course Outcome 3	Recommend special purpose machine for specific applications.		
Learning Outcome E0540138	Describe constructional features of various special purpose machines. (cognitive domain)	8	10
Contents	<ul style="list-style-type: none"> • Stepper Motor – Permanent magnet type & Variable reluctance type • Switched Reluctance Motor (SRM) • Linear Induction Motor (LIM) • Permanent Magnet Synchronous Motor (PMSM) and Permanent Magnet DC (PMDC) motor • Induction Generator 		
Method of Assessment	External: End Semester Theory Exam – Pen Paper test.		
Learning Outcome E0540139	Choose appropriate machines for specific applications. (cognitive domain)	6	7
Contents	<ul style="list-style-type: none"> • Stepper Motor – Permanent magnet type & Variable reluctance type • Switched Reluctance Motor (SRM) • Linear Induction Motor (LIM) • Permanent Magnet Synchronous Motor (PMSM) and Permanent Magnet DC (PMDC) motor • Induction Generator 		
Method of Assessment	Internal: Mid Semester Test-2 – Pen paper test & Assignment		
Course Outcome- 4	Analyze the performance of synchronous motor.		
Learning Outcome E05401410	Explain constructional features and working of synchronous motor. (Cognitive domain)	6	8
Contents	<ul style="list-style-type: none"> • Construction of synchronous machine and types of rotor • Working principle of synchronous motor and methods of starting • Hunting and its prevention • Comparison of synchronous motor with induction motor 		
Method of Assessment	Internal: Mid Semester Test -2– Pen paper test & Assignment		

Learning Outcome E05401411	Analyze the effect of change in excitation on the performance of synchronous motor. (Cognitive domain)	6	8
Contents	<ul style="list-style-type: none"> • Phasor diagram • Effect of change in excitation 		
Method of Assessment	<i>External: End Semester Theory Exam – Pen Paper test.</i>		
Learning Outcome E05401412	Draw V curves and inverted V curves of synchronous motor and discuss. (Psychomotor & affective domain)	8	10
Contents	<ul style="list-style-type: none"> • Plot V curves of synchronous motor • Plot inverted V curves of synchronous motor 		
Method of Assessment	Internal: performance of task, observation & viva voce		
Course Outcome- 5	Evaluate the performance and demonstrate the characteristics of synchronous generator.		
Learning Outcome E05401513	Discuss working principle and related concepts of synchronous generator. (Cognitive domain)	12	14
Contents	<ul style="list-style-type: none"> • Working principle of synchronous generator • Advantages of stationary armature and rotating field • Speed-frequency relationship • Pitch factor, Distribution factor and Winding factor • EMF equation of synchronous generator • Brief idea of excitation system • Factors affecting the terminal voltage of alternator • Concept of synchronous impedance • Cooling methods of synchronous generator 		
Method of Assessment	<i>External: End Semester Theory Exam – Pen Paper test.</i>		
Learning Outcome E05401514	Analyze performance of synchronous generator and solve numerical problems. (Cognitive Domain)	4+4	10
Contents	<ul style="list-style-type: none"> • Equivalent circuit • Phasor diagram • Regulation by EMF method • Parallel operation: conditions and advantages • Numericals on generated EMF and voltage regulation 		
Method of Assessment	<i>External: End Semester Theory Exam – Pen Paper test.</i>		

Learning Outcome E05401515	Conduct various tests on synchronous generator. (Psychomotor & affective domain)	14	18
Contents	<ul style="list-style-type: none"> • Plot OC and SC characteristics • Perform synchronization of synchronous generator by Lamp method and synchroscope 		
Method of Assessment	<i>External: End semester practical Exam-Performance of Task & viva voce</i>		

Reference Books:

1. Dr. S. K. Sahdev, Electrical Machines, Cambridge University Press.
ISBN:9781108431064
2. Bhattacharya S. K. Electrical Machines, McGraw Hill Education, New Delhi,
ISBN:9789332902855
3. Theraja B. L., Electrical Technology Vol – II (AC and DC Machines), S. Chand and Co. Ltd., New Delhi,
ISBN: 9788121924375
4. Ashfaq Husain: Electric Machines, Dhanpat rai and Co.
ISBN:978-81-7700-166-2
- 5.P. S. Bimbhra, Electrical Machines Vol – I & II, Khanna Book Publishing House.
ISBN: 978-9386173-447,978-93-86173-607
- 6.Mehta V. K. and Mehta Rohit, Principle of Electrical Machines, S. Chand and Co. Ltd.,New Delhi.
ISBN: 9788121930888
- 7.Kothari D. P. and Nagrath I. J., Electrical Machines, McGraw Hill Education New Delhi.
ISBN:9780070593572, 9780070699670.