

# School of Aeronautics (Neemrana)

**I-04, RIICO Industrial Area, Neemrana, Dist. Alwar, Rajasthan**

Approved by Director General of Civil Aviation, Govt. of India, All India Council for Technical Education  
Ministry of HRD, Govt of India & Affiliated to Rajasthan Technical University, Kota & BTU, Bikaner Rajasthan

Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 26 / SET 1

### Instructions For Students / Faculty Mid Term I (Total 60 Marks, 2 HRS. Syllabus From Beginning Of Session)

• Part A: Total number of questions to be given are five, each carrying 3 marks and are compulsory to attend. There is no choice. They are short answer type questions (**Not More Than 25 Words For Both Question & Answer**), no objective type or fill in the blanks. Total 15 marks.

• Part B: Total number of questions to be given are six, out of which student has to answer any four. They are long answer type (**Not More Than 50 Words For Question**), each carrying 6 marks. Total 24 marks.

• Part C: Total number of questions to be given are four, out of which student has to answer any three. They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question**)\*, each carrying 7 marks. Total 21 marks.

### Mid Term II & III (Total 90 Marks, 2.5 HRS. Syllabus From Beginning Of Session)

• Part A: Total number of questions to be given are ten, each carrying 2 marks and are compulsory to attend. There is no choice. They are short answer type questions (**Not More Than 25 Words For Both Question & Answer**), no objective type or fill in the blanks. Total 20 marks

• Part B: Total number of questions to be given are seven, out of which student has to answer any five. They are long answer type (**Not More Than 50 Words For Question**), each carrying 6 marks. Total 30 marks.

• Part C: Total number of questions to be given are five, out of which student has to answer any four. They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question**)\*, each carrying 10 marks. Total 40 marks.

\* **LIST OF ELABORATIVE THEORY QUESTION SUBJECTS:** 3 MH4 - 07 Manufacturing Process, 4 AN4 - 06 Aircraft Materials and Processes (Cr 3), 5 AN4 - 05 Aircraft System (Cr 3), 6 AN4 - 05 Avionics-I (Cr 3), 6 MH4 - 03 Applied Hydraulics & Pneumatics (Cr 3), 6 MH5 - 11 Principles of Management (Cr 3), 6 MH5 - 13 Aircraft Electronics System (Cr 3), 7 AN5 - 12 Maintenance of Airframe and System (Cr 3), 7 AN5 - 13 Helicopter Theory (Cr 3), 7 AG6 - 60.1 Human Engineering and Safety (Cr 3), 7 ST - 01 Avionics II (Special Theory Subject) (Cr 3), 7 MH5 - 11 Design of Mechatronics Systems (Cr 3), 7 MH5 - 12 Robotics and Machine Vision System (Cr 3), 7 MH6 - 13 Medical Electronics (Cr 3), 7 AN6 - 60.1 Aircraft Avionic System (Cr 3), 8 AN5 - 12 Maintenance of Power Plant and System (Cr 3), 8 AN5 - 13 Unmanned Aerial Vehicles & Systems (UAV) (Cr 3), 8 MH5 - 13 Product Development & Launching (Cr 3), 8 EC6 - 60.2 Robotics and control (Cr 3)

FACULTY MEMBERS, PLEASE ENSURE EXCEPT ABOVE LISTED SUBJECTS, NO THEORITICAL ELABORATIVE QUESTION SHOULD BE GIVEN IN PART 'C' OF QUESTION PAPER

### Question Paper & Student Details

<b>Mid Term</b>	Mid Term 2	<b>Date of Submission</b>	19/08/2020
<b>Name of Faculty</b>	Mr. Jyoti Ranjan	<b>Date of Examination</b>	25/08/2020
<b>Course</b>	B.Tech (Mechatronics Engineering)	<b>Semester</b>	SEMESTER : 5
<b>Batch</b>	Fourth (4)	<b>Subject</b>	5 MH4 - 04 Electrical Machines (Cr 3)


### COURSE OUTCOMES FOR REFERENCE TO FRAME QUESTION PAPER

(Faculties are required to mention relevant Course Outcome number against the respective question in QP)

<b>Course Outcome</b>	1. Able to gain knowledge about the fundamental principles and classification of the magnetic circuit. 2. Able to gain knowledge about the working of DC generators. 3. Able to gain knowledge about testing and applications of DC Motors. 4. Able to gain knowledge about electromechanical energy conversion. 5. Able to gain knowledge about testing and applications of Brushless DC motors.		
<b>Email I'd</b>	jyotiranjana@soaneemrana.org	<b>Phone No.</b>	798-216-0660
<b>Student Name</b>		<b>Student Reg No.</b>	

<b>Part A</b>			
<b>Question : 1</b>	Explain Coercive force .		
2	magnetic circuit	EE V K MEHTA CH 8	1
<b>Question : 2</b>	Explain Magnetizing Force (H) .		
3	magnetic circui	EE V K MEHTA CH 8	1
<b>Question : 3</b>	Define ferromagnetic Materials.		

8	magnetic circuit	EE V K MEHTA CH 8	1
<b>Question : 4</b>	Define Pole-Cores and Pole-Shoes DC Generator.		
10	DC Generator	BLT Part 2	2
<b>Question : 5</b>	Explain the difference between lap winding and wave winding		
11	DC Generator	BLT Part 2	2
<b>Question : 6</b>	Define Resistance Commutation		
12	DC Generator	BLT Part 2	2
<b>Question : 7</b>	Explain Plugging or Reverse Current Braking.		
24	DC Motors	BLT Part 2	3
<b>Question : 8</b>	What are the various methods of controlling speed?		
21	DC Motors	BLT Part 2	3
<b>Question : 9</b>	Explain the Variation of Flux or Field Control Method to Control Motor Speed.		
20	DC Motors	BLT Part 2	3
<b>Question : 10</b>	Explain Regenerative Braking		
24	DC Motors	BLT Part 2	3
<b>Part B</b>			
<b>Question : 1</b>	Extend the working of a Three-point Starter.		
21	DC Motors	BLT Part 2	3
<b>Question : 2</b>	with a neat figure explain the Armature Reaction.		
11	DC generators.	DC generators.	2
<b>Question : 3</b>	what is Compensating Windings?		
13	DC generators.	DC generators.	2
<b>Question : 4</b>	Derive the equation to find out AT per pole in Cross-magnetising.		
13	DC generators.	DC generators.	2
<b>Question : 5</b>	Explain the Brake Test of DC Motor.		
23	DC Motors	BLT Part 2	3
<b>Question : 6</b>	Explain Swinburne's Test of DC Motor.		
23	DC Motors	BLT Part 2	3
<b>Question : 7</b>	Explain Rheostatic or Dynamic Braking		
24	DC Motors	BLT Part 2	3
<b>Part C</b>			
<b>Question : 1</b>	An iron ring has a cross-sectional area of $400 \text{ mm}^2$ and a mean diameter of 25 cm. It is wound with 500 turns. If the value of relative permeability is 250, find the total flux set up in the ring. The coil resistance is $474 \Omega$ and the supply voltage is 240 V.		
4	magnetic circui	EE V K MEHTA CH 8	1
<b>Question : 2</b>	Calculate the reactance voltage for a machine having the following particulars. Number of commutator segments = 55, Revolutions per minute = 900, Brush width in commutator Defsegments = 1.74, Coefficient of self-induction = $153 \times 10^{-6}$ henry, Current per coil = 27 A		

12	DC Generator	BLT Part 2	2
<b>Question : 3</b>	A 220 V shunt motor has an armature resistance of 0.2 ohms and field resistance of 110 ohms. The motor draws 5 A at 1500 r.p.m. at no load. Calculate the speed and shaft torque if the motor draws 52 A at rated voltage.		
22	DC Motors	BLT Part 2	3
<b>Question : 4</b>	A short-shunt compound generator delivers a load current of 30 A at 220 V and has armature, series-field, and shunt-field resistances of 0.05 $\Omega$ , 0.30 $\Omega$ , and 200 $\Omega$ respectively. Calculate the induced e.m.f. and the armature current. Allow 1.0 V per brush for contact drop.		
10	DC Generator	BLT Part 2	2
<b>Question : 5</b>	An 8-pole d.c. shunt generator with 778 wave-connected armature conductors and running at 500 r.p.m. supplies a load of 12.5 $\Omega$ resistance at a terminal voltage of 50 V. The armature resistance is 0.24 $\Omega$ and the field resistance is 250 $\Omega$ . Find the armature current, the induced e.m.f. and the flux per pole.		
8	DC Generator	BLT Part 2	2
<b>Upload Scanned Document In Case of Numerical or Diagram For Any of The Above Questions.</b> (Mention question number with relevant fig / numerical / equations. Max 150 KB)			
<b>I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.</b>			

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