School of Aeronautics (Neemrana)

Instructions For Students / Faculty

Back / Re-back Internal Examination (Total 60 Marks, 2 Hrs, Syllabus From Beginning of The Session)

Total number of questions to be given are 10, each carrying 10 marks and it is compulsory to attend 2 questions from Part A and 4 questions from Part B. There is a choice of two questions out of four in part A and 4 questions out of 6 in Part B. Part A will be theoretical or derivation type **(Not More Than 70 Words For Question).** Part B will be fully numerically oriented questions **(Not More Than 70 Words For Question)**, except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

* LIST OF ELABORATIVE THEORY QUESTION SUBJECTS: Aircraft Materials, Aircraft System, Aircraft Rules & Regulation-I, Mechanics of Composite Materials, Aircraft Design, Aircraft Rules & Regulation-II, Avionics-I, Helicopter Theory, Maintenance of Airframe and System Design, Avionics-II, Airlines and Airport Management, Maintenance of Power Plant & Systems

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

STUDENT IS ALLOWED TO ENTER LATE NOT MORE THAN 15 MIN AFTER STARTING OF EXAM, AND MAY LEAVE THE EXAM HALL ON EXPIRY OF ATLEAST OF 1 Hr FROM THE STARTING TIME OF EXAMINATION

Question Paper & Student Details

Name of Faculty*	Mrs Tarun Thukral	**Date of Submission of QP**	15/03/2021
Subject*	5MH4 - 02 - Power Electronics (New)	**Date of Examination***	22/03/2021
Email Id of Faculty:*	tarunthukral@soaneemrana.org	**Course***	B.Tech (Aeronautical Engineering)
Phone Number of Faculty*	750 096 6580	**Semester***	Semester : 5

Student Name		**Student Reg No.**	

Part A

Question : 1*   Explain the construction, working and characteristics of SCR.

Lesson Plan*	3	**Topic***	Power Semi Conductor Devices	**Source***	Power Electronics by Dr

Question : 2*   Explain the integral cycle control of AC voltage controller.

Lesson Plan*   33   **Topic***   AC Voltage Controllers and Cyc   **Source***   Power Electronics by Dr

Question : 3*   Explain the circuit diagram of 18 thyristor three phase to three phase cycloconverter.

Lesson Plan*   40   **Topic***   AC Voltage Controllers and Cyc   **Source***   Power Electronics by Dr

Question : 4*   Explain 120 degree mode three phase bridge inverter with waveforms.

Lesson Plan*   27   **Topic***   Inverters   **Source***   Power Electronics by Dr

Part B

Question : 1*   A single phase voltage controller has input voltage of 230 V, 50 Hz and a load of R= 15 ohm. For 6 cycles on and 4 cycles off,
determine :
a. rms output voltage
b. input pf c. average and rms thyristor currents.

Lesson Plan*   34   **Topic***   AC Voltage Controllers and Cyc   **Source***   Power Electronics by Dr

Question : 2*   A step up chopper has input voltage of 220 V and output voltage of 660 V. If the non-conducting time of chopper is 120μs, compute the pulse width of output. If pulse width is halved for constant frequency operation, find the new output voltage.

| **Lesson Plan*** | 18 | **Topic*** | Chopper | **Source*** | Power Electronics by Dr |

Question : 3*

For an SCR, gate cathode characteristics is given by $Vg = 1 + 10Ig$. Gate source voltage is a rectangular pulse of 15V with 20
microsec duration. For an average gate power dissipation of 0.3W and a peak gate drive power of 5W, compute:
a. resistance to be connected in series with the SCR gate.
b. the triggering frequency and
c. the duty cycle of the triggering pulse.

| **Lesson Plan*** | 3 | **Topic*** | Power Semi Conductor Devices | **Source*** | Power Electronics by Dr |

Question : 4*

A single phase transformer with secondary voltage of 230 V, 50 Hz delivers power to load R = 15 ohm through a half wave controlled
rectifier circuit. For a firing angle delay of 30 degree. Determine:
i. Rectification Efficiency
ii. Form factor
iii. Ripple Factor
iv. TUF
v. PIV of Thyristor

| **Lesson Plan*** | 10 | **Topic*** | Phase Controlled Converters | **Source*** | Power Electronics by Dr |

Question : 5

A single phase full converter is bridge is connected to RLE load. The source voltage is 230 V, 50 Hz. The average load current of 10 A is
continuous over the working range. For R= 0.4 ohm and L= 2mH, compute:
a. firing angle delay for E= 120V
b. firing angle delay for E= -120V
Find pf for both firing angle delay.

| **Lesson Plan** | 12 | **Topic** | Phase Controlled Converters | **Source** | Power Electronics by Dr |

Question : 6

For a three phase bridge inverter delivers power to a resistive load from a 450 V dc source. For a star connected load of 10 ohm per
phase, determine for 180 degree mode VSI
i. rms value of load current
ii. rms value of thyristor current
iii. load power.

| **Lesson Plan** | 27 | **Topic** | Inverter | **Source** | Power Electronics by Dr |

Upload Scanned Document In Case of Numerical or Diagram for any of the above question

Mention question number with relevant fig / numerical / equations. Max 150 KB

Choose files or drag here

I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.