

School of Aeronautics (Neemrana)

Question Paper For Back / Re-back Internal Assessment Examination (Theory) - Old Scheme i.e 2012 Syllabus

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 THEORETICAL 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*	Ashok Bhatia	Date of Submission of QP	27/11/2020
Subject*	4AN4 - Theory of Machines (Old)	Date of Examination*	02/12/2020
Email Id of Faculty:*	ashokbhatia@soaneemrana.org	Course*	B.Tech (Aeronautical Engineering)
Phone Number of Faculty*	798 815 8760	Semester*	Semester : 4

Student Name		Student Reg No.	
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Part A

Question : 1*	Explain the terms : 1. Lower pair, 2. Higher pair, 3. Kinematic chain, and 4. Inversion
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Lesson Plan*	3	Topic*	Simple Mechanisms	Source*	Theory of Machine by R
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Question : 2*

State and prove the law of gearing. Show that involute profile satisfies the conditions for correct gearing.

Lesson Plan*

24

Topic*

Gears

Source*

Theory of Machine by R

Question : 3*

Derive from first principles an expression for the effort required to raise a load with a screw jack taking friction into account. Explain the effect of the gyroscopic couple on the reaction of the four wheels of a vehicle negotiating a curve.

Lesson Plan*

17

Topic*

Gyroscopic Couple

Source*

Theory of Machine by R

Question : 4*

A four cylinder vertical engine has cranks 150 mm long. The planes of rotation of the first, second and fourth cranks are 400 mm, 200 mm and 200 mm respectively from the third crank and their reciprocating masses are 50 kg, 60 kg and 50 kg respectively. Find the mass of the reciprocating parts for the third cylinder and the relative angular positions of the cranks in order that the engine may be in complete primary balance.

Lesson Plan*

37

Topic*

Reciprocating Masses

Source*

Theory of Machine by R

Part B

Question : 1*

Sketch and explain the various inversions of a slider crank chain.

Lesson Plan*

5

Topic*

Simple Mechanisms

Source*

Theory of Machine by R

Question : 2*

In a four bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°.

Lesson Plan*

9

Topic*

Relative Velocity

Source*

Theory of Machine by R

Question : 3*

Two gear wheels mesh externally and are to give a velocity ratio of 3 to 1. The teeth are of involute form ; module = 6 mm, addendum = one module, pressure angle = 20° . The pinion rotates at 90 r.p.m. Determine : 1. The number of teeth on the pinion to avoid interference on it and the corresponding number of teeth on the wheel, 2. The length of path and arc of contact, 3. The number of pairs of teeth in contact, and 4. The maximum velocity of sliding.

Lesson Plan*

25

Topic*

Gears

Source*

Theory of Machine by R

Question : 4*

In an epicyclic gear train, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 r.p.m. in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed, makes 300 r.p.m. in the clockwise direction, what will be the speed of gear B ?

Lesson Plan*

28

Topic*

Gear Trains

Source*

Theory of Machine by R

Question : 5

A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

Lesson Plan

33

Topic

Balancing of Rotating Masses

Source

Theory of Machine by R

Question : 6

A single dry plate clutch transmits 7.5 kW at 900 r.p.m. The axial pressure is limited to 0.07 N/mm^2 . If the coefficient of friction is 0.25, find 1. Mean radius and face width of the friction lining assuming the ratio of the mean radius to the face width as 4, and 2. Outer and inner radii of the clutch plate.

Lesson Plan

19

Topic

Clutch

Source

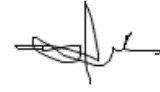
Theory of Machine by R

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

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



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Question Paper & Student Details

Name of Faculty*	<input type="text" value="Deepak Tomar"/>	Date of Submission of QP	<input type="text" value="28/11/2020"/>
Subject*	<input type="text" value="4AN2-01- Digital Science (New) (Credit-2)"/>	Date of Examination*	<input type="text" value="02/12/2020"/>
Email Id of Faculty:*	<input type="text" value="deepaktomar@soaneemrana.org"/>	Course*	<input type="text" value="B.Tech (Aeronautical Engineering)"/>
Phone Number of Faculty*	<input type="text" value="965 454 4096"/>	Semester*	<input type="text" value="Semester : 4"/>

Student Name	<input type="text"/>	Student Reg No.	<input type="text"/>
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Part A

Question : 1*

Build basic gates AND, NOT, OR using NOR gate.

Lesson Plan*

Topic*

Source*

Question : 2*

Explain SOP form in detail considering 3 variables A,B & C with function(Output) as $A+BC'$.

Lesson Plan*

10

Topic*

SOP form

Source*

Digital Electronics Princ

Question : 3*

What are positive and negative logic? Explain the working of 2 input positive logic OR gate using a diode circuit.

Lesson Plan*

6

Topic*

Positive and negative logic

Source*

Digital Electronics Princ

Question : 4*

Write short notes on
a) Half Adder b) Full Adder

Lesson Plan*

13

Topic*

Adder

Source*

Digital Electronics Princ

Part B

Question : 1*

What is a multiplexer? Draw circuit diagram of 8: 1 multiplexer. Explain its working in brief.

Lesson Plan*

14

Topic*

Multiplexer

Source*

Digital Electronics Princ

Question : 2*

A. Convert (444.499) base 10 into octal.
B. Convert (345.2912) base 8 into decimal.

Lesson Plan*

4

Topic*

Conversion

Source*

Digital Electronics Princ

Question : 3*

Discuss K-Map for two, three & four variable input and also elaborate rules to simplify a Boolean expression.

Lesson Plan*

8

Topic*

K-Map

Source*

Digital Electronics Princ

Question : 4*

What is demultiplexer? Explain the working of a 1:4 demultiplexer with a logic diagram.

Lesson Plan*

15

Topic*

Demultiplexer

Source*

Digital Electronics Princ

Question : 5

Explain the working of JK flip-flop. How can you convert the flip-flop into a D flip-flop?

Lesson Plan

16

Topic

Flip-flop

Source

Digital Electronics Princ

Question : 6

Explain EMC & EMI in detail.

Lesson Plan

25

Topic

EMC & HIRF

Source


Digital Electronics Princ

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A handwritten signature in black ink, appearing to be 'D. Kumar', written above a horizontal line. The signature is contained within a rectangular box.