SAPTHAGIRI COLLEGE OF ENGINEERING, BENGALURU-57

DEPARTMENT OF MECHANICAL ENGINEERING

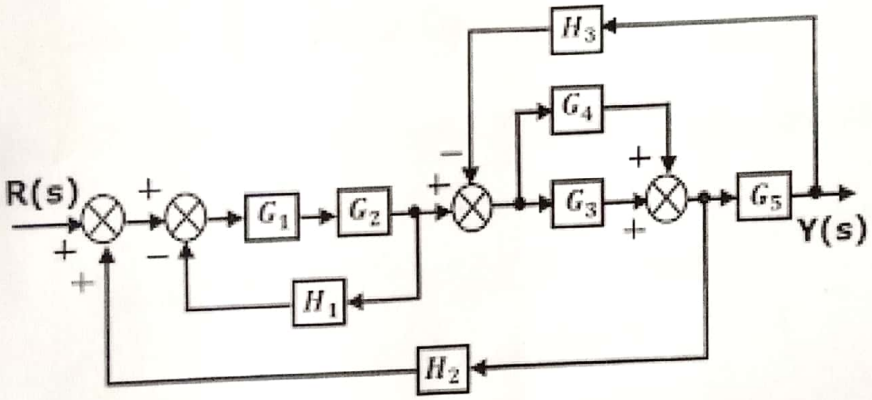
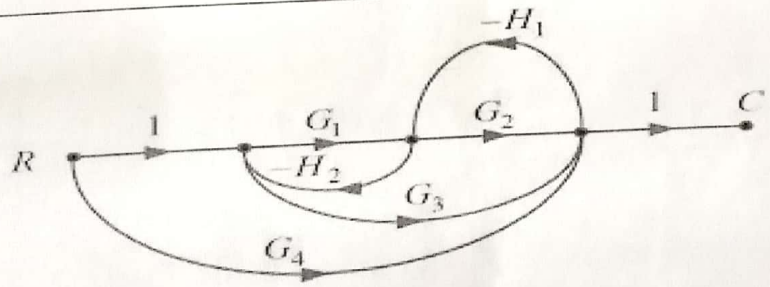
Control Engineering (15ME73)

Internal Assessment I - Odd Semester 2019-20

Sem /Sec: 7th A & B
Time: 1½ Hours

Date: 10/09/2019
Max. Marks: 30

Note: Answer any one full question from each module.

Q.No.	Module -1	Marks	RBT Level	COs
1. (a)	Explain open loop and closed loop control system with neat sketch. Mention any two differences.	- 08 -	L1, L2	CO1
(b)	Explain any one Automatic control system.	- 07 -	L1, L2	CO1
	OR			
2. (a)	Explain PID Controller with characteristics Curve.	- 08 -	L1, L2	CO1
(b)	Explain the ideal requirement of Control system.	- 07 -	L1, L2	CO1
	Module -2			
3. (a)	Derive the Transfer function of Armature Controlled DC Motor.	- 10 -	L1, L2	CO2
(b)	Write a note on models of Hydraulic Systems.	- 05 -	L1	CO2
	OR			
4. (a)	Reduce the block diagram and obtain transfer function Y(S)/R(S) 	- 08 -	L3	CO2
(b)	 Find the transfer function using Mason's gain formula.	- 07 -	L3	CO2

CO1: Able to describe basics of principles of control system and controllers.
CO2: Able to determine the system governing equations for physical models.

Signature of co-coordinator,

1.Dr.Tulsidas D
2. Prathima C N

HOD

Course Coordinator,

USN	1	S	G	1		M	E			

15ME64

SAPTHAGIRI COLEEGE OF ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING

FIRST INTERNAL ASSESSMENT – EVEN SEMESTER 2018-19

DESIGN OF MACHINE ELEMENTS-II

Sem & Sec: 6th 'A'& 'B'
Time: 90 Min

Date: 13-03-2019
Max. Marks: 30

Note: Answer any one full question from each Module

Q. NO.		MODULE - II	MARKS	RBT LEVEL	CO's
1.	a.	Design a helical spring used in recoil system so as to absorb 120Nm energy with a maximum force of 300N.Assume spring index 8 and FOS 2.	-08-	L1	CO5
	b.	A leaf spring of span 1.1m absorb shocks due to a maximum load of 75KN.The spring material can sustain a stress of 0.4Gpa.All the leaves are equally stressed. The spring having 3 full length leaves and 15 graduated leaves. Width of central band is 100mm.The ratio of total spring depth to width is 2.Take E=200Gpa and Design the spring.	-07-	L1, L2, L3	CO5

OR

2.	a.	A truck spring has 12 leaves, two of which are full length leaves. The spring supports are 1.05m apart and the central band is 85mm wide. The central load is to be 5400N with a permissible stress of 0.28GPa. The ratio of total depth to width is 3.Take E=200Gpa and Design the spring.	-08-	L1, L2, L3	CO5
	b.	Derive an expression for shear stress in helical compression spring of circular section. Explain notations with units.	-07-	L1, L2	CO5

Q. NO.		MODULE - II	MARKS	RBT LEVEL	CO's
3.	a.	A belt is required to transmit 18.5KW from a pulley of 1.2m diameter running at 250rpm to another pulley which runs at 500rpm. The centre distance is 2.7m. Coefficient of friction 0.25, safe working stress 1.75N/mm², thickness 10mm, Design the belt for open belt drive.	-10-	L1, L2, L3	CO2
	b.	Briefly explain wire ropes. Mention their applications.	-05-	L1, L2	CO3

OR

4.	a.	A belt of width 200mm weighing 20N/m, connecting 300mm diameter pulley to 900mm diameter driven pulley at a shaft spacing of 6m, transmits 55.2kw at a speed of 25m/s. Determine i) Angle of lap, belt length and ii) Belt tensions.	-10-	L1, L2, L3	CO2
	b.	Explain chain drive with neat sketch. Mention their merits and demerits.	-05-	L1, L2	CO3

****

CO2: Able to design belts for power transmission.
CO3: Able to describe wire ropes and chain drives.
CO5: Able to design springs, clutches and brakes.

Name and Signature of Course coordinator

(Mr. Chetan B P)

Scrutinized by
1. Dr. Tulsidas D :
2. Mr.Pramod S V:

Sapthagiri College of Engineering

(Affiliated to VTU, Belagavi & Approved by AICTE, New Delhi)
#14/5, Chikkasandra, Hesaraghatta Road, Bangalore-560057
Karnataka

Project Work
Diary & Assessment Record

Department	MECHANICAL
Project Batch No.	B13
Name of the Guide	MAHESH S
Name of the Project coordinator	RAMESH NG , RAM KUMAR M

PROJECT-TEAM			
Sl.No	USN	Name	Initial
1	1SG16ME008	AMBAPRASAD G HEGDE	AGH
2	1SG16ME039	K AKASH HEBBAR	KAH
3	1SG16ME044	KESHAV A	KA
4	1SG16ME048	M AMRITHA NAIR	MAN

Marks Obtained by each student					
Assessment	Max. Marks	USN 1SG16ME008	USN 1SG16ME039	USN 1SG16ME044	USN 1SG16ME048
Phase-1	**100**				
Phase-2	**100**				
SEE	**100**				

Signature of the Guide **Coordinator** **HOD**

PROGRAM OUTCOMES

Graduates of Bachelor of Engineering program at Sapthagiri College of Engineering will attain the following program outcomes in the field of engineering. This applies to all branches of Engineering.

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

2. **Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and Engineering sciences.

3. **Design/Development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Professor & Head
Department of Mechanical Engineering
Sapthagiri College of Engineering
Bengaluru - 560 057.

SAPTHAGIRI COLLEGE OF ENGINEERING

(Affiliated to VTU, Belagavi and approved by AICTE, New Delhi)
#14/5, Chikkasandra, Hesaraghatta main road, Bengaluru-560057

DEPARTMENT OF MECHANICAL ENGINEERING

15MEL76: DESIGN LABORATORY

COURSE OUTCOMES

At the end of the course the student will be able to

CO1: Analyze the characteristics in a single degree of freedom in vibrating systems.

CO2: Analyze the rotating elements for balancing, critical speed and journal bearing of shafts.

CO3: Compute the fringe constant of photo elastic material for different loading conditions.

CO4: Analyze the characteristics of governors and gyroscope.

CO5: Analyze the stresses for combined loading in straight and curved beam using strain gauges.

Lab incharge

HOD

Professor & Head
Department of Mechanical Engineering
Sapthagiri College of Engineering
Bengaluru - 560 057