B. Tech. 5th Semester (F) Scheme (AUE) Examination,

December–2018

DESIGN OF MECHANICAL SYSTEM

Paper–AUE-301-F

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *Attempt any **five** questions. **Question Number one is compulsory** and selecting at least **one** question from each section. Design data book is permitted and assume suitable data whenever required.*

1. (a) Write short note on concurrent engineering. 4

(b) What is clutch ? How can you classify the clutches ? 4

(c) Compare ball and roller bearing. 4

(d) What are the advantages and drawbacks of centrifugal clutch ? 4

(e) Write short note on Gear Lubrication. 4

Section–A

2. (a) Explain the various causes of shaft failure. What is the effect of key way on the strength of the shaft ? Explain. 10

(b) What is a Clutch ? Explain the various types of clutches in use with figure. 10

3. Explain the various types of brakes with figure. Calculate the energy absorbed by the brake. 20

Section–B

4. A pair of parallel helical gears consists of a 18 teeth pinion meshing with a 45 teeth gear. A 7.5 kW power at 2000rpm is supplied to the pinion through its shaft. The normal module is 6mm, while the normal pressure angle is 23°. Determine the tangential, radial and axial components of the resultant tooth force between the meshing teeth. 20

5. (a) Write the complete terminology of gear with figure. 10

(b) Explain the concept of Dynamic load on gear teeth. 10

Section–C

6. What is bearing ? Classify the bearing on various basis. How Selection of Bearings is done from manufacturer's catalogue ? Explain. 20

7. A ball bearing is operating on a work cycle consisting of three parts-a radial load of 3000N at 1440 rpm from one quarter cycle, and load of 5000N at 720 rpm for one half cycle, and radial load of 2500 N at 1440 rpm for the remaining cycle. The expected life of the bearing is 10000 hr. Calculate the load carrying capacity of the bearing. 20

Section–D

8. What is the concept of simultaneous engineering discuss in detail and explain the same ? 20

9. Discuss the steps of design of cylinder head or as per your choice. 20