

**Code No: 154AF****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech II Year II Semester Examinations, March - 2022****BASIC MECHANICAL ENGINEERING FOR CIVIL ENGINEERS****(Civil Engineering)****Time: 3 Hours****Max. Marks: 75**

**Answer any five questions**  
**All questions carry equal marks**

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- 1.a) What are the functions of cam and follower? Explain different types of cams used along with their applications.
- b) Explain the advantages of composite materials in comparison with metals and alloys. [8+7]
- 2.a) What are different methods of failure of riveted joints? Explain their failure behavior.
- b) Differentiate between helical gears and bevel gears based on their function and applications. [7+8]
- 3.a) How to make use of chain drives in operation of different civil engineering equipment? Explain.
- b) In an cross belt drive, the driver pulley having a diameter of 200 mm and is rotated at 600 rpm and makes 400 mm follower pulley to be rotated for power transmission. If the center distance between the driver and follower pulley is 750 mm, then calculate the speed ratio, length of the belt required and power transmission. [7+8]
- 4.a) Explain the principle of operation of industrial truck used in construction works with a simple diagram.
- b) What are the major differences between internal combustion engines and external combustion engines based on working principles? [7+8]
- 5.a) What do you understand by the term refrigeration? Explain the working principle of air refrigeration system.
- b) Explain the Fourier law of heat conduction and derive the equation for the slab. [8+7]
- 6.a) Draw the layout of internal combustion engine and explain constructional and operational principles.
- b) Explain different sheet metal processes for making different shapes. [8+7]
- 7.a) Differentiate between brazing and soldering processes and discuss the importance of these processes.
- b) What are different components for making mould and casting process? Explain their functions. [8+7]
- 8.a) What are different processes performed on lathe machine? Explain them along with their applications.
- b) Describe the principle of operation of grinding machine along with the suitable line diagram. [8+7]