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**B. Tech. 2nd Semester F. Scheme Examination,
May-2014**

BASICS OF MECHANICAL ENGINEERING

Paper-ME-101-F

Common for all branches

Time allowed : 3 hours]

[Maximum marks : 100

Note : Attempt any five questions in total at least one question from each section. Question no. 1 is compulsory. Each question carries equal marks (20 marks).

1. Discuss the following : 5×4
- (a) Types of Milling machines
 - (b) Vapour refrigeration cycle
 - (c) Relationship between elastic constants
 - (d) Straight line system.

Section-A

2. (a) What is the principle of planer ? Discuss different types of planer machines. 10

(b) A system exists with 0.2 m³ of a gas at 4 bar and 425K. It is expanded adiabatically to 1 bar. The

3. (a) What is the principle element of metal cutting ?
What is the single point and multi point cutting tool ? 10
- (b) Steam at pressure 15bar and 0.95 dry is generated in a boiler and is made to pass through its super heater where additional quantity of heat is supplied to steam at constant pressure. Consequently the temperature of steam increases to 350°C . Determine the following :
- (i) Heat supplied in the super heater
- (ii) Change in internal energy. 10

Section-B

4. (a) An air refrigeration system working on Bell Coleman cycle draws air from the cold chamber at 5°C and 1 bar. The air is compressed to 7 bar and then cooled to 25°C before sent to the expansion cylinder. If compression and expansion are isentropic, find the COP of the system and

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5. (a) How would you classify the pumps ? What is priming and why it is important ? 10
- (b) Discuss Psychrometric processes in detail. 10

Section-C

6. (a) Derive an expression for centrifugal tension for flat belt drive. What is the initial tension in belt ? 10
- (b) Discuss bending equation in detail. 10
7. (a) Discuss Hook's law. Also discuss stress strain diagram in detail. 10
- (b) What is the function of a clutch ? Explain the working of friction clutch with the help of a neat sketch. 10

Section-D

8. (a) What do you understand by automation ? Explain the components of a manufacturing system. 10
- (b) What is the procedure of Numerical control ? How are numerical control systems classified ? 10