

B.TECH. DEGREE EXAMINATIONS: APRIL / MAY 2009

Third Semester

TEXTILE TECHNOLOGY (FASHION TECHNOLOGY)**U07ME307 Basics of Mechanical Engineering****Time: Three Hours****Maximum Marks: 100****Answer ALL the Questions:-****PART A (20 x 1 = 20 Marks)**

1. Internal energy of substance depends upon
 - a) Pressure
 - b) Temperature
 - c) Enthalpy
 - d) Velocity
2. $Q/T = \text{Constant}$ is known as
 - a) Kelvin-Planck statement
 - b) Clausius statement
 - c) Carnot's Principle
 - d) Carnot's theorem
3. During throttling process of an ideal gas
 - a) Pressure does not change
 - b) Internal energy does not change
 - c) Enthalpy does not change
 - d) Volume does not change
4. Dryness fraction of steam is defined as
 - a) Mass of wet steam/Mass of dry steam
 - b) Mass of dry steam/Mass of wet steam
 - c) Mass of dry steam/ Mass of water vapour suspension
 - d) Mass of wet steam/ Mass of water vapour
5. Which one of the following is high grade energy
 - a) Heat energy
 - b) Pressure energy
 - c) Potential energy
 - d) Electrical Energy
6. Ash disposal is the major problem in
 - a) Nuclear power plant
 - b) Hydro electric power plant
 - c) Thermal power plant
 - d) Solar power plant
7. An example of a High pressure water tube boiler
 - a) Cochran boiler
 - b) Babcock and Wilcox boiler
 - c) Lamont boiler
 - d) Simple vertical boiler
8. Identify a renewable energy source
 - a) Fossil fuel energy
 - b) Solar energy
 - c) Boiler energy
 - d) Nuclear energy
9. Which one of the following is not a component of an IC engine
 - a) Connecting rod
 - b) Cylinder head
 - c) Piston
 - d) Cross head
10. Function of carburetor is
 - a) To speedup the fuel flow
 - b) To purify the fuel
 - c) To mix the fuel with air
 - d) To save the fuel

11. One tonne of refrigeration is

- a) 1.5 kw b) 2.5 kw c) 3.5 kw d) 4.5 kw

12. A thermometer covered by a wet cloth measures

- a) Dry bulb temperature b) Wet bulb temperature
c) Dew point temperature d) Condenser temperature

13. How many kinds of flames are there in gas welding

- a) 2 b) 3 c) 4 d) 5

14. Which is the most important in arc welding

- a) Length of the arc b) Length of the electrode
c) Length of the holder d) Length of the work piece

15. Another name of down milling

- a) Conventional milling b) Climb milling
c) Modern milling d) Strong milling

16. IC engine connecting rods are manufactured by

- a) Milling b) Extrusion c) Forging d) Rolling

17. Suitable drive for short distance power transmission

- a) Chain drive b) Shaft drive c) Power drive d) Belt drive

18. Worm and worm wheel is used in

- a) Quick return mechanism b) Reverse mechanism
c) Steering mechanism d) Crank mechanism

19. In bevel gear power transmission, included angle between shafts

- a) 120° b) 240° c) 90° d) 270°

20. Flywheel is not used in

- a) IC engine b) Sugar cane juice extracting machine
c) Paper cutting machine d) Paint spraying machine

PART B (5 x 16 = 80 Marks)

21. a) i) Draw the PV diagram of constant pressure process and brief it. (6)
ii) Derive the steady flow energy equation of a thermodynamic system. (10)

(OR)

21. b) i) 10 kg of air at 10 bar and 400°C expands reversibly and adiabatically to 1 bar.
Find the work done and internal energy (constants $\gamma = 1.4$, $R = 0.287 \text{ KJ/KgK}$,
 $C_v = 0.718 \text{ KJ/Kg.K}$).

22. a) Draw and explain elaborately the steam power plant.

(OR)

22. b) i) How the wind energy is converted in to electrical energy in Horizontal axis wind mill? Explain. (10)

ii) Distinguish between impulse turbine and reaction turbine. (6)

23. a) i) List out the different classification of IC engines. (10)

ii) Tabulate the differences between 2 stroke and 4 stroke engines. (6)

(OR)

23. b) Depict and explain the vapour absorption refrigeration system.

24. a) i) Explain the AC arc welding process with the help of neat diagram. (10)

ii) What are the various advantages of hot working process? (6)

(OR)

24. b) Draw the Horizontal axis milling machine and give details about the principal parts.

25. a) i) Draw and give the speed ratio equation of simple gear train (8)

ii) Distinguish between open and crossed belt drives. (8)

(OR)

25. b) The maximum and minimum speed of a flywheel are 1010 rpm and 990 rpm respectively. The mass of the flywheel is 25 kg and radius of gyration is 10 cm. Determine mean speed of the flywheel and maximum fluctuation of energy
