B.Tech. (ME / CE) (Sem.–6)
COMPUTER AIDED DESIGN
Subject Code : BTME-613-18
M.Code : 79658
Date of Examination : 11-01-2025

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Answer briefly:

   (a) Discuss the role of coordinate system in Geometric Modeling.

   (b) Explain the industrial benefits of CAD.

   (c) Give difference between analytical and synthetic curves.

   (d) Discuss the mechanical properties of solid.

   (e) What are Ruled surfaces?

   (f) Explain the topology of solid modeling using diagram.

   (g) Discuss translation transformation taking 2-D example.

   (h) Discuss the significance of Orthographic projection.

   (i) Discuss in general analytical properties of assembly design.

   (j) Explain oblique projection with example.

SECTION-B

2. Discuss the historical developments that taken in CAD with respect to Indian Industry?

3. Discuss the equation and explain the characteristics of Bezier curve?

4. Explain the fundamentals of the solid design and explain the role of curves in solids?

5. Discuss the differences between properties of Bezier and B-spline surfaces.

6. Write a short note boundary representation in solid modeling.

SECTION-C

7. Discuss the concept of rotation and scaling Homogeneous Transformations by taking a suitable 2-D example.

8. Discuss various basic concepts of assembly modeling and give the uses of Bill of Material in CAD assembly design.

9. Write a short note on the concept and advantages of Constructive Solid Geometry in CAD.

B.Tech. (ME) (Sem.–6)

INTRODUCTION TO INDUSTRIAL MANAGEMENT

Subject Code : BTME-604-18

M.Code : 79653

Date of Examination : 10-01-2025

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Answer briefly:**

   a) List the various activities of industrial engineering.

   b) Enumerate the various elements of TQM.

   c) Differentiate between Product Design and Product Development.

   d) What is breakeven analysis?

   e) What is the basic principle of preventive maintenance?

   f) What are the different costs that are involved in the inventory problem?

   g) Give any four benefits of sound maintenance system.

   h) What are objectives of inventory control?

   i) What are fundamental objectives of purchasing?

   j) Define Benchmarking.

SECTION-B

2. How is TQM different from traditional approach to management? Give examples.

3. Explain the reasons for customer grievances in a retail organization.

4. Write a detailed note on product life cycle.

5. Discuss the process of benchmarking with the help of an example.

6. Elaborate the evaluation and selection procedure of vendors. What is the significance of vendor's location?

SECTION-C

7. a) **Explain the following functions of maintenance:**

   i) Preventive Function.

   ii) Corrective Function.

   iii) Training Function.

   iv) Recording Function.

   b) Discuss the role of maintenance department in machine life enhancement.

8. What do you understand by selective inventory control? Discuss one method of selective inventory control in details.

9. **Write short notes on the following :**

   a) Product planning.

   b) Traditional vs. modern industrial engineering.

   c) JIT

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

B.Tech.(ME) (Sem.–6)
# AUTOMOBILE ENGINEERING
Subject Code : BTME603-18
M.Code : 79652
Date of Examination : 08-01-2025

me : 3 Hrs.

Max. Marks : 60

ISTRUCTIONS TO CANDIDATES :
1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. **Write briefly :**

   a. Define idling.

   b. What are the various advantages of independent suspension systems?

   c. Explain the functions of radiator.

   d. Explain the functions of propellor shaft.

   e. Explain the functions of a clutch in the transmission system.

   f. Explain term weight transfer during breaking.

   g. What are the causes of stiff steering?

   h. What are the advantages of tubeless tyres?

   i. What are the advantages of anti-lock braking systems?

   j. What do you understand by toe-in of front wheels?

SECTION-B

2. Explain merits and demerits of AT; AMT; CVT; DCT/DSG automatic transmission systems.

3. Explain tractive effort and vehicle performance curve.

4. Draft preventive maintenance schedule of a passenger car.

5. Why do we use multi-cylinder engine instead of the equivalent single cylinder with same displacement volume. Justify your answer by considering some suitable engines parameters.

6. Explain the working of water-cooling system for diesel engine using its main components.

SECTION-C

7. **Write short notes on:**

    a. Individual pump and nozzle system.

    b. Unit injector system.

    c. Common rail system.

    d. Distributor system.

8. **Explain the following with suitable diagrams:**

    a. Construction and working of telescopic type shock absorber.

    b. Explain hotch kiss driver with neat sketch.

9. Explain constant mesh and synchromesh gear box in detail.

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B.Tech. (Mechanical Engineering)(Sem.–6)

REFRIGERATION AND AIR CONDITIONING

Subject Code : BTME-601-18

M.Code : 79650

Date of Examination: 07-01-2025

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1.   **Write briefly :**

   a) What is difference between refrigeration and cooling?

   b) What is the function of flash intercooler?

   c) Explain sub-cooling and superheating with a neat sketch.

   d) Differentiate between primary and secondary refrigerants.

   e) What is principle of vapour absorption refrigeration?

   f) What are advantages of compound compression?

   g) Define apparatus dew point temperature.

   h) Differentiate between ventilation load and infiltration load.

   i) What is difference between domestic and industrial air conditioning?

   j) Define sensible heat factor.

SECTION - B

2. A simple vapour compression plant produces 5 tonnes of refrigeration. The enthalpy values at inlet to compressor, at exit from the compressor, and at exit from the condenser are 183.19, 209.41 and 74.59 kJ/kg respectively. Estimate

   a) The refrigerant flow rate

   b) The C.O.P

   c) The power required to drive the compressor

   d) The rate of heat rejection to the condenser.

3. Explain the working of a practical Ammonia-water vapour absorption refrigeration system with neat sketch.

4. Discuss the eco-friendly refrigerants to protect the ozone layer through global control, eventually elimination of production and utilization of ozone depleting substances.

5. Explain with neat sketch the working of thermostatic expansion value. Where it is used?

6. The humidity ratio of atmospheric air at 28°C dry bulb temperature and 760 mm of mercury is 0.0016 kg/kg of dry air. Determine :

   a) Partial pressure of water vapour

   b) Relative humidity

   c) Dew point temperature

   d) Specific enthalpy

   e) Vapour density.

SECTION - C

7. A reversed Carnot cycle working as heat pump is delivering 40000 kJ/min to heat the conditioned space & maintaining it at 25° C when the outside temperature of atmosphere is 15° C. Determine the heat absorbed from the atmosphere air and the power required to operate the cycle. If the same space is to heated by electric coil heaters, determine the power consumed by the electric heater.

8. An air conditioned auditorium is to be maintained at 27°C DBT and 60% RH. The ambient condition is 40°C DBT and 30°C WBT. The, total sensible heat load is 100000 kJ/h and total latent heat load is 40000 kJ/h. 60% of the return air is recirculated and mixed with 40% of make-up air after the cooling coil. The condition of air leaving the cooling coil is at 18°C. Determine:

   a) Room Sensible Heat Factor

   b) The condition of air entering the auditorium

   c) The amount of make-up air

   Show the process on psychrometric chart.

9. a) Describe winter air conditioning system.

   b) How does an actual vapour compression cycle differ from that of a theoretical cycle?

   c) Compare vapour compression and vapour absorption refrigeration systems.