Total No. of Questions : 8]

SEAT No. :

P3921

[Total No. of Pages : 3

[6001]-4004
F.E.
SYSTEMS IN MECHANICAL ENGINEERING (SME)
(2019 Credit Pattern) (Semester - I) (102003)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.No.1 or Q.No.2, Q.No.3 or Q.No.4, Q.No.5 or Q.No.6, Q.No.7 or Q.No.8.***
2) ***Neat Diagram must be drawn wherever necessary.***
3) ***Figures to the right indicates full marks.***

Q1) a) Classify automobiles based on various considerations. **[7]**

b) Define vehicle specification, Explain following engine specifications - **[7]**

i) Torque

ii) Power and

iii) Stroke

c) Compare vehicle specifications for two-wheeler and three-wheeler vehicles. **[4]**

OR

Q2) a) Explain various components of S. I engine with neat sketch. **[7]**

b) Explain hybrid vehicle with neat sketch. Mention its components. **[7]**

c) State difference between electric and hybrid vehicle with examples. **[4]**

Q3) a) Explain the working principle of ABS system in vehicle with neat sketch. State its importance over conventional braking system. **[7]**

b) Explain construction and working of disc brake system with neat sketch. **[7]**

c) Define Gear Ratio for gear box. Determine gear ratio, if a pinion 110 mm with pitch circle diameter meshes with a gear of 450 mm pitch circle diameter. The number of teeth on pinion is 20 and it rotates at 1550 rpm. **[3]**

OR

P.T.O.

Q4) a) State types of steering system? Explain Ackerman steering mechanism with neat sketch. **[7]**

b) Explain construction and working of single plate clutch with neat sketch. **[7]**

c) Why safety arrangements needed in vehicle? Explain the importance of seat belts and air bags in the vehicle. **[3]**

Q5) a) State the importance of sheet metal working in manufacturing. Explain Punching and Blanking with neat sketch. **[7]**

b) State significance of Metal Cutting process in industry. Explain following metal cutting processes: **[7]**

i) Turning

ii) Milling and

iii) Drilling operation with neat sketch.

c) Draw a block diagram of 3D printer with all its components. **[4]**

OR

Q6) a) Explain sand casting process with neat sketch. State its advantages and disadvantages. **[7]**

b) With neat sketch explain the shielded metal arc welding. State its applications. **[7]**

c) Write a short note on open and closed die forging. **[4]**

Q7) a) Using block diagrams, write a short note on **[7]**

i) Electric Geyser and

ii) Electric iron State specifications for Electric Geyser. **[7]**

b) Explain with block diagram, working of a refrigerator, state its domestic and industrial applications. **[7]**

c) An electric motor driven pump fills an over headed tank placed at a height of 20 m from the ground level. The mass of the water pumped per second is 5.56 kg. Input power of the motor is 2200 W. Calculate the efficiency of the motor. (Use $g = 9.81\ m/s^2$) **[3]**

OR

Q8) a) Using block diagram, explain the application of blower in kitchen chimney and vacuum cleaner. **[7]**

b) State various applications of springs in domestic appliances. With neat sketch, explain any one mechanism making use of spring. **[7]**

c) A refrigerator has working temperatures in the evaporator and condenser coils as - 30°C and 32°C. What is the maximum COP of the system? Draw its block diagram. **[3]**