Total No. of Questions : 8]

SEAT No. : [ ]

PC-1677

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F.E.
Systems in Mechanical Engineering (SME)
(2019 Pattern) (Semester - I) (102003)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

All questions are compulsory

Q1) a) Classify automobiles based on various considerations and specify examples of each type. **[7]**

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

c) Write a short note on cost analysis of the vehicle. **[4]**

OR

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

b) State importance of vehicle specification. Provide vehicle specifications for any two-wheeler. **[7]**

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

Q3) a) Explain various components mounted on the chassis with neat sketch. **[7]**

b) State importance of suspension system. Explain telescopic suspension system with neat sketch. **[7]**

c) Explain working of water - coolitig system in vehicle with neat diagram. **[3]**

OR

P.T.O.

Q4) a) A pillion with 110 mm 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. Determine

i) Gear ratio

ii) Number of teeth on gear and

iii) Speed of the gear. **[7]**

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

c) Draw a block diagram of fuel supply system for petrol engines wtth its components. **[3]**

Q5) a) Explain sand casting process with neat sketch. State its advantages and disad vantages. **[7]**

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

c) Explain a process of product development using 3D printing process. **[4]**

OR

Q6) a) Define metal forming process. Discuss extrusion and drawing process with neat sketch. **[7]**

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

c) Explain concept of Internet of Things (IoT) and its applications in manufacturing. **[4]**

Q7) a) State various applications of springs in domestic appliances. With neat sketch, explain any one mechanism marking use of spring. **[7]**

b) Explain working of a printer with block diagram. **[7]**

c) Draw neat sketch of water pump used for overhead tank. **[3]**

OR

Q8) a) With the help of block diagram, explain working of electric geyser. State various specifications for an electric geyser. **[7]**

b) Why product specifications are important? Explain the specifications for refrigerator and air conditioner. **[7]**

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