Total No. of Questions : 8]

SEAT No. :

PB3588

[Total No. of Pages : 2

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F.E.

SYSTEMS IN MECHANICAL ENGINEERING

(2019 Pattern) (Semester-I/II) (Credit System) (102003)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Attempt question Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must he drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

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

OR

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

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

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

Q3) a) A pinion 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. **[7]**

i) Gear ratio

ii) Number of teeth on gear and

iii) Speed of the gear.

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

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

OR

P.T.O.

Q4) a) Explain various components mounted on the chassis with neat sketch. **[7]**

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

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

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

OR

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

Q7) a) With the help of block diagram, explain working of electric geyser. State various specifications for an electric geyser. **[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) State various applications of springs in domestic appliances. With neat sketch, explain any one mechanism making use of spring. **[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 20 m 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]**