

Sample Test Paper - I

Course Name : Mechanical Engineering Group

Course Code : AE/FE/ME/MH/MI/PG/PT/PS

Semester : Second

Subject Title : Applied Science (Chemistry)

Marks : 25

17203

Time:1 Hour

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**Instructions:**

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR of the following.**

**08 Marks**

- a) Define corrosion. Mention types of corrosion with one example of each.
- b) Describe factors affecting atmospheric corrosion.
- c) Why rate of corrosion is more at Mumbai than Pune.
- d) Define cementation or diffusion.
- e) Give important zones in the blast furnace with their temperature ranges.
- f) State composition of pig iron and slag.

**Q.2 Attempt any THREE of the following.**

**09 Marks**

- a) Give the composition, properties and uses of low carbon steels.
- b) Define heat treatment. Give the four purposes of heat treatment.
- c) Write the composition, properties and applications of 18-4-1 HSS.
- d) Write mechanism of electrochemical corrosion by absorption of oxygen.
- e) Describe the process of sherardizing with the help of diagram.

**Q.3 Attempt any TWO of the following.**

**08 Marks**

- a) Name and describe process used for protection of odd and irregular shaped articles.
- b) Distinguish between normalizing and annealing.
- c) How sacrificial anodic protection can be done?

Sample Test Paper - II

Course Name : Mechanical Engineering Group

Course Code : AE/FE/ME/MH/MI/PG/PT/PS

Semester : Second

Subject Title : Applied Science (Chemistry)

Marks : 25

17203

Time:1 Hour

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**Instructions:**

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

**Q.1 Attempt any FOUR of the following.**

**08 Marks**

- a) Define fuel. Give its two example.
- b) What are the essential properties of a fuel?
- c) Name synthetic lubricants. What is their special feature?
- d) Write two fractions obtained after fractional distillation of petroleum. Give atleast one use of it.
- e) Define acid value and saponification value of lubricant.
- f) Write advantages of graphite as solid lubricant

**Q.2 Attempt any THREE of the following.**

**09 Marks**

- a) Define proximate analysis. Give the four purposes of proximate analysis.
- b) Write composition, properties and applications of CNG.
- c) How are the lubricants are classified? Give one example of each.
- d) Define viscosity, viscosity index, fire point.
- e) Write the lubricant used for gears, steam engines and road rollers.

**Q.3 Attempt any TWO of the following.**

**08 Marks**

- a) Distinguish four points between solid and gaseous fuel.
- b) Draw labeled diagram and explain construction of bomb calorimeter.
- c) Explain the boundary lubrication with diagram.

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## Sample Question Paper

Course Name : Mechanical Engineering Group

Course Code : AE/FE/ME/MH/MI/PG/PT/PS

Semester : Second

Subject Title : Applied Science (Chemistry)

Marks : 50

# 17203

Time:2 Hrs.

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**Instructions:**

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

**Q.1 Attempt any NINE**

**18 Marks**

- a) Write sequential steps involved in extraction of iron from its ore.
- b) Why does the pig iron melts at lower temperature than pure iron.
- c) State four purposes of heat treatment.
- d) Give two uses of Alnico.
- e) Define corrosion. Give two types of it.
- f) State factors affecting immersed corrosion.
- g) Name two methods used for applying protective coating.
- h) Name and define the process used for protection of small iron articles.
- i) Define calorific value and ignition temperature.
- j) Write four purposes of proximate analysis.
- k) How is CNG more economical than other types of fuel?
- l) What is lubrication? Name the types of lubrication.

**Q.2 Attempt any FOUR**

**16 Marks**

- a) Write the chemical reactions taking place in the zone of reduction of blast furnace.
- b) Write composition, properties and applications of nichrome steel.
- c) Describe method of heat treatment useful to increase the cutting ability of steel.
- d) Write the four characteristics of good fuel.
- e) Distinguish between solid fuel and liquid fuel.
- f) Describe with labeled diagram, the process of refining of crude petroleum oil.

**Q3. Attempt any FOUR**

**16 Marks**

- a) Write mechanism of corrosion of metal due to action of oxygen.
- b) Describe the mechanism of electrochemical corrosion by evolution of hydrogen gas.
- c) Distinguish between galvanizing and tinning.
- d) Define following properties of lubricant i) Viscosity Index, ii) Oiliness, iii) Fire Point, iv) Cloud Point.
- e) Define lubricant. Write the four functions of lubricants.
- f) Explain the Fluid film lubrication with diagram