MECHANICAL ENGINEERING GROUP & PLASTIC ENGINEEING.

Sample Question Paper of Mechanical Engineering Group & Plastic Engg.

9010

Exam Seat No.									

Maharashtra State Board of Technical Education

Course Name: Mechanical Engineering Group & Plastic Engg.

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

Semester :- second

Subject: - Applied science Subject Code: - 9010

Duration: 3 Hours (For Both Sections together) Marks: 80

Section - I

Q1. Attempt any eight of the following: (16 marks)

a) Show with diagram VT diagram for

a) Uniform velocity motion

b) Uniform retardation motion.

b) State three equations of motions in case of circular motion.

c) If velocity of particle in S.H.M. is V= ? $(a^2-x^2)^{1/2}$ calculate velocity of Particle when it is at (I) mean position when it is at extreme position.

d) State Newton's second law of motion with mathematical equation.

e) Define with unit work & power.

f) State work energy principle.

g) For surface disorders which of the following method is used & why?.

a)RT b) UT c) LPT

h) State principle of magnetic particle testing method.

i) IF the distance between 2 walls is 16.5 meters, is there a chance of hearing echo if velocity of sound is considered as 330 m/s ?

j) State how focusing of sound affects the acoustical planning of auditorium?

k) State laws of illumination.

Q 2. Attempt any three of the following: (12 marks)

a) 1. A train changes its speed uniformly from 50 km/hr to 100 km/hr in a distance of 500m. What is acc^{n} ?

2. Draw VT diagram in above case & calculate distance using VT diagram.

b) A flywheel rotating at 300 rpm slows down uniformly to 200rpm completing 200 revolutions retardations. Calculate a) Total time of retardation b) rate of retardation.

c) A train weighing 19,60000N moves on the track at 16.67 m/s. after the steam is shut off, it is brought to rest by applying breaks in 500m. Find the force exerted by the break.

d) Name the NDT methods used in industry. For complete investigation of material for surface & sub- surface disorders state the four factors on which NDT methods can be selected.

Q 3 Attempt any three of the following: (12 marks)

a) Describe LPT with it's a) principle of working b) set up c) sequential steps d) advantages

b) Out of RT, UT, PT, MT, Thermography, which method is suitable for investigating disorders in following cases:

1) To locate distance of outside crack from one of the surfaces of Components.
2) To investigate internal defect like porosity in any type of material.
3) To detect sub-surface disorders up to 2.5mm depth in ferrous material.
4) to investigate in service investigations in pipes of heat exchangers.

c) Define a) loudness with its units b) intensity of sound with its units Differentiate between loudness & intensity of sound.

c) State four factors affecting acoustical planning of buildings & state how they are to be adjusted for good acoustics.

SECTION - II

Q. 4.A. Attempt any FOUR of the following **08 marks**

1. How alloys are classified ?
2. Define heat treatment of steel.
3. What is the difference between the corrosion of aluminium and magnesium due to atmosphere?
4. Define viscosity and viscosity index.
5. Name the materials used for formation of Teflon.

Q. 4.B. Attempt any TWO of the following **08 marks**

1. Give chemical composition properties and uses of porcelain.
2. Explain extreme pressure lubrication.
3. Write four functions of lubricant used in gears.

Q. 5. Attempt any THREE of the following **12 marks**

1. Distinguish between hardening and tempering.
2. Give composition properties and uses of phosphor bronze.
3. Describe tinning process for the protection of metal against corrosion.
4. Write chemical reactions taking place in the zone of reduction of blast furnace.

Q. 6. Attempt any THREE of the following **12 marks**

1. Explain the role of oxide film in atmospheric corrosion.
2. Compare between metal spraying and metal cladding.
3. Explain four factors affecting electrochemical corrosion.
4. Describe the process of dry corrosion.