

The question paper consists of two sections. Instructions are given against each.

Time : 10 minutes for reading the paper + 3 hours

Please write briefly and legibly. Illustrate your answers with suitable sketches as necessary.

Part A: Professional Subjects

Marks

This is further split into two sections - Section I and Section II (as a separate sheet).

(100+20)

Section II (20 marks) is compulsory. Attempt any four questions from Section I (100 marks).

Do remember to attach Section II along with your answer-sheet.

Part A: Section I

(100)

- 1 (a) Describe the heat treatment process followed for coil springs made in ICF. What is the purpose of tempering? What changes in microstructure take place during the process? (15)
- (b) What is Almen test and what is its purpose? What other tests are performed on springs right from bars stage? (10)
- 2 What facilities are available for testing the incoming material in Shell and Furnishing? What tests are performed for rubber, cushioning material, and rexine? Describe any two methods in detail. (25)
- 3 (a) Describe the paint system as followed in painting coach exteriors in ICF. What parameters are measured as per RDSO/ M&C/ PCN/ 100? Which of these can be said to be performance parameters? (20)
- (b) What are the advantages of water based PU paint system? (5)
- 4 (a) What are the signs and properties of a good weld joint? How can the weld penetration be checked? What other tests are performed to test the quality of welders? (15)
- (b) What are the special requirements for welding SS with MS and SS with SS? (5)
- (c) What special precautions are required to be taken for thin-sheet welding? What are the common faults in thin-sheet welding? (5)
- 5 (a) Enumerate the steps for systematic investigation of a coil-spring failure. What does a crystalline fracture surface indicate regarding the nature of failure? (10)
- (b) How do you investigate failure of roller bearings? (15)
- 6 Write short notes on any five of the following: (5x5=25)
- (a) Normalising and annealing (5)
- (b) Brinell and Vickers hardness testing (5)
- (c) Izod and Charpie test (5)
- (d) Testing of Compreg (5)
- (e) Test to check glass content of FRP (5)
- (f) Yield strength and UTS (5)

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(a) Hardness and toughness

(5)

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Part B - General Subjects

Marks

Attempt any two questions. Both carry equal marks.

(30)

- 1 (a) Define Rajbhasha. (3)
- (b) ICF falls in which region as defined by the Official Languages Act? (2)
- (c) What is the target for originating correspondence from ICF to government offices in region A to be in Hindi? (2)
- (d) What documents are listed under Article 3(3) of the Official Languages Act, and what are the provisions for such documents? (8)
- 2 (a) What are the penalties listed as major penalties in the Railway Servants (Disciplinary and Appeals) Rules 1968? (3)
- (b) What are the provisions under section 14(2) of the rules? (2)
- (c) What are the various stages in D&A proceedings under major penalty up to imposition of penalty? (10)
- 3 (a) What demand grants are operated by ICF and for what purposes? (5)
- (b) Define Workshop Manufacturing Suspense and Stores Suspense. Why are they called Suspense? (5)
- (c) What are the various stages in budgeting exercise in ICF? (5)
- 4 Write short notes on any three of the following: (5x3=15)
- (a) Special Limited Tender (5)
- (b) Proprietary Article Certificate (5)
- (c) EIW workers (5)
- (d) Leave encashment (5)

Part A: Section II (Maximum Marks 20)

10/10

1. What does ETP stand?
(a) Extruded Thermosetting Plastic (b) Effluent Treatment Plant
(c) Electrical Tool and Plant (d) None of the above
2. What type of camera is used for radiographic testing of welds/ castings in ICF?
(a) α -ray camera (b) γ - ray camera
(c) Digital SLR camera (d) None of the above
3. What is submerged arc welding?
(a) Welding carried out by divers under water (b) Welding where arc is shielded by an inert gas like Argon
(c) Welding where arc is shielded by a molten slag covering of flux (d) None of the above
4. Which scale is used for measuring the hardness of rubber components?
(a) Vickers (b) Shore A
(c) Rockwell A (d) None of the above
5. Which equipment can be used for finding out the constituent polymers of rubber?
(a) Infrared Spectroscope (b) Spectrometer
(c) Partial distillation equipment (d) None of the above
6. Which is NOT the purpose of Paint?
(a) Corrosion prevention (b) Aesthetics improvement
(c) Surface protection (d) All the above are the purposes
7. Which of the following is not an ISO standard?
(a) 9001 (b) 14001
(c) 18001 (d) All the above are ISO standards
8. Which is the hardest micro-constituent of iron-carbon?
(a) Pearlite (b) Cementite
(c) Ferrite (d) None of the above
9. What is the main passive layer in SS?
(a) Cr_2O_3 layer (b) NiO layer
(c) Mn_3O_4 layer (d) None of the above

