

Written Examination (75% quota) for promotion from Gr C to Gr B - ACMT

Note: This question paper is in two parts

- Part A is for professional subjects: Max Marks = 120
- Part B is for Establishment and Financial Rules: Max Marks = 30

Instructions:

- Time allowed: 3 hours + 10 minutes for going through the question paper
- Please answer briefly and legibly
- Please illustrate your answers with suitable sketches where necessary

Part A: Professional Subjects

This is further split in two sections – Section I and Section II (as a separate sheet)

Attempt any four questions from Section I

Section II is compulsory. Please tick the appropriate answer and attach with your answer-sheet.

Section I (Max Marks 100)

1. What grades of steel are used in manufacturing LHB Hybrid coaches for their side-wall, end-wall, roof, under-frame and trough floor? Discuss the differences between Ferritic and Austenitic stainless steel in respect of their composition, strength, weldability, corrosion resistance and price. Which SS grade is amenable to magnetic skin-tensioning and why? (25)
2. (a) What are the essentials for a good welded joint? What welding processes are being followed in ICF? Discuss merits and demerits of each. What precautions are to be taken in MIG welding and what is the role played by the gas type (CO₂ or Argon) and its purity? How does one prevent spatter and burn through? (20)
(b) What are the tests performed for periodic qualification of welders? (5)
3. (a) Describe the process of spring manufacture as followed in ICF. What are the defects commonly encountered and how can they be prevented? What role can be played by the M&C organization in improving the quality? (15)
(b) Describe the Normalizing process, followed for all forged items. Why is it necessary to do so? What changes in microstructure occur in steel during normalizing? (10)
4. (a) Describe the coach painting process followed at ICF in Furnishing division. Describe the importance of each step. (10)
(b) What are the common defects in painting and how can they be prevented? (10)

- (c) What special precautions are to be taken while painting SS coaches? (5)
5. (a) Explain briefly along with sketches as required, various NDT methods at ICF. Discuss their applications, merits, limitations. (10)
- (b) Describe Ultrasonic Testing of Axles. What is the principle behind it? Why is it necessary to use other than normal probes as well? What are these probes and how are they used? Explain with sketches. What is the limitation of this testing? (15)
6. (a) Write in detail the type tests and acceptance tests required to be conducted for Paints according to RDSO's specification for paints for exteriors. In what aspects PU paints score over Alkyd paints? (20)
- (b) What is meant by 'Anti Graffiti paint' and how does it work? (5)
7. Write short notes on the following. They carry equal marks. (5 x 5 = 25)
- (a) Testing of Compreg for boiling water resistance.
- (b) Flame retardancy, Smoke visibility, and Toxicity of furnishing material.
- (c) Sample preparation for metallographic testing.
- (d) Testing of PVC flooring material of coaches
- (e) Hot phosphating process and the chemistry behind it.

Part B: Establishment and Financial Rules (Max marks = 30)

Attempt any two questions. They carry equal marks.

1. What is the process for imposing minor penalty on a delinquent railway servant? What are the minor penalties? (15)
2. What is the Budgeting process of Indian Railways? What grants are applicable for ICF? What is the calendar of budgeting exercise? (15)
3. What are the features of Special Incentive Scheme being followed in ICF for the year 2010-11? For earning 70% incentive, how much allowed time is reduced? (15)
4. What incentives are given to railway employees for working in Rajbhasha? Cover various employees including stenographers and officers. What are the training programmes available for training in Rajbhasha? (15)

Part A: Section II (Maximum Marks 20)

This section has 20 multiple choice questions of 1 mark each. No negative marking.

Tick whichever option is correct. Only one option may be ticked.

No corrections of any type (erasure, cutting, multiple ticks, scoring out an answer, overwriting, or modifying the answer in any way) are permitted. In case of corrections, the answer will not be evaluated.

Attach this sheet securely to your answer sheet.

1. What does EOHS stand for?
a) Elective Operational Health Scheme b) Electrically Operated Heart Surgery
c) Environment, Occupational Health & Safety d) None of these
2. Which of the following is not used for Non-Destructive Testing?
a) α -particles b) Gamma rays
c) X-rays d) Ultrasonic Waves
3. Which element in stainless steel imparts the anti-corrosion properties to it?
a) Fe b) Cr
c) Ni d) Mn
4. Which rubber out of the following is the most resistant to mineral oils?
a) Polychloroprene b) Nitrile
c) SBR d) Natural Rubber
5. Which of these can be used for micro-hardness testing?
a) Brinell b) Rockwell
c) Vickers d) Shore
6. Of the following is the most corrosion resistant steel?
a) IRS-M 47 b) SS-409M
c) SS-304 d) None of these
7. Which of the following cushioning materials has the least Toxicity Index?
a) Latex foam b) Polyurethane foam
c) Rubberized Coir d) Recron
8. Which of these is the most elastic material?
a) Natural Rubber b) Glass
c) Steel d) Copper
9. ICF is certified for which of the following standards?
a) ISO - 14001:1997 b) ISO - 9001:2008
c) OHSAS - 18001:1999 d) All of these

10. Which etchant is used for preparing ferrous samples for metallographic examination?
- a) 5% Hydrochloric acid in ethanol b) 5% Nitric acid in ethanol
c) 5% Sulfuric acid in ethanol d) None of these
11. Which of the following grades shows work-hardening properties?
- a) IRS M-47 b) SS - 304
c) SS - 409 M d) None of these
12. For which process is steel required to be heated to the highest temperature?
- a) Full annealing b) Stress relieving
c) Tempering d) Hardening
13. Which of the following micro-constituents of steel is the hardest?
- a) Pearlite b) Martensite
c) Bainite d) Ferrite
14. Which welding process involves minimum heat affected zone?
- a) Submerged Arc Welding b) MIG welding
c) TIG welding d) Flash Butt Welding
15. Which type of crack could remain undetected by UST of axles?
- a) Transverse, in the middle b) Longitudinal
c) Transverse, at the wheel seat d) None of these
16. Which paint out of the following has the least VOC?
- a) Alkyd b) Polyurethane
c) Water based polyurethane d) Nano polyurethane
17. Why are steel shots not suitable for blasting Stainless steel shells?
- a) Steel shots have less hardness than SS b) They can start bimetallic corrosion
c) Both a) and b) d) None of these
18. Which steel is used for spring manufacture in ICF?
- a) Ni-Cr steel b) Cr-V steel
c) Cr-Mo-V steel d) None of these
19. Etch primer is used in ICF for which of the following?
- a) Below window sill inside sidewalls b) Under the under-frame near lavatory
c) On SS sidewalls and roofs d) None of these
20. Which welding wire is used for welding SS trough floor in under-frame stage?
- a) SS flux cored wire b) SS solid wire
c) SS self-shielded wire d) None of these