

INTEGRAL COACH FACTORY, CHENNAI – 38

Question paper for selection of Assistant Electrical Engineers through Departmental Examination

Date : 21.09.2011

Time: 3 hours

Max.Marks: 150

- NOTE:** 1) Answer any **THREE** questions from Part-A ; **TWO** questions from Part-B and **ALL** 15 questions from Part-C
2) Part-C should be answered in Question Paper itself. Each question of part - C carries 2 marks.

PART – A

Marks: 3 x 30

Attempt any **THREE** questions. Each question carries 30 marks. If more than three questions are attempted, only the first three will be evaluated.

1. a) How air-conditioning has been done in buildings in ICF? What is preventive maintenance of different units? What measures should be taken to prevent fire in these units? (10)
b) Draw typical layout of a substation in ICF. (10)
c) What are relative merits of HT & LT supply? Explain steps taken in ICF to reduce maximum demand (10)
2. a) Calculate typical electrical load of a type-IV quarter. What precautions are taken for safety against electric shock & fire? (10)
b) Explain different types of pumps. What are their relative merits? (10)
c) What is standby power supply arrangement in ICF? How essential loads have been segregated (10)
3. a) What are differences between SG & EOG? Which is efficient & why? (10)
b) What measures have been taken to prevent fire in AC & TL coaches? (10)
c) What is difference between LMLA & VRLA lead acid batteries? Explain their working principles. (10)
4. a) Draw schematic diagrams of power & auxiliary circuits of EMU working in Eastern Railway(15)
b) What are the advantages of 3 phase AC EMUs over conventional AC EMU (5)
c) Explain EP & auto brake system in EMU (10)

5. Write short notes on any **four** of the following (4 x 7.5)
If more than four are attempted, only the first four will be evaluated
- a) Emergency Feed Terminal (EFT)
 - b) 2 X 650 AH battery system for AC coaches
 - c) LED based emergency lights in AC coaches
 - d) Water raising apparatus (WRA)
 - e) Composite brake blocks
 - f) Inter vehicular couplers in EMUs
 - g) Parking brake in EMUs
6. Write short notes on any **four** of the following (4 x 7.5)
If more than four are attempted, only the first four will be evaluated
- a) Parallel operation of transformers in a substation
 - b) Electronic energy meters
 - c) Eco friendly refrigerants
 - d) Multi stage pumping
 - e) RMPU
 - f) PIS in EMU
 - g) Dead man device in EMU
7. a) Calculate the air-conditioning plant capacity of a BG AC Sleeper coach with 46 berths making & stating suitable assumptions (15)
- b) Draw the power & auxiliary schematics of 3 phase IGBT based propulsion system of AC EMU (15)

PART – B

Marks: 2 x 15

Answer any **TWO** questions. Each question carries 15 marks. If more than two questions are attempted, only the first two will be evaluated.

1. Write short notes on any **two** of the following (2 x 7.5)
If more than two are attempted, only the first two will be evaluated
- a) Right to Information Act
 - b) HOER
 - c) Minor & Major penalties
 - d) Various types of leave
2. Explain briefly any **three** of the following (3 x 5)
If more than three are attempted, only the first three will be evaluated
- a) Rolling stock programme
 - b) Various types of tenders for material procurement
 - c) Direct & indirect workers

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- d) Financial justification for Works proposal
 - e) Works register
 - f) Imprest cash
3. a) What is meant by notified office? (5)
- b) Explain 'proficiency in Hindi' & 'working knowledge in Hindi' (5)
- c) Write short note on Hindi workshop (5)
4. a) Explain in brief procedure & preparation of Railway budget in respect of ordinary working expenses (7.5)
- b) Explain in brief Railway services conduct rules (7.5)

PART – C

Marks: 30

Attempt **ALL 15** questions. Each question carries 2 marks. Tick only one option. No correction of any type is permitted. In case any correction is made, that answer will not be evaluated. The correction may be any one of the following types (the list is illustrative and not exhaustive) viz., cutting, over writing, erasing, scoring of a ticked answer in multiple choice and ticking another answer and modifying the answer in any way.

- 1) Effective capacitance of two 64 MFD capacitor in parallel in MFD is
(a) 16, (b) 32, (c) 64, (d) 128
- 2) The traction motor used in AC DC EMU is
(a) Single Ph.AC (b) DC (c) 3 Ph.AC Synchronous (d) 3 Ph.AC asynchronous
- 3) A 250 hp, 3 Ph. 440 V, 100 Hz, 6 pole Inductor Motor runs at 1900 rpm on full load. Then the slip in % is
(a) 0.5, (b) 5, (c) 10, (d) 50
- 4) If the voltage applied to a resistance is doubled, the power drawn is
(a) doubled, (b) halved, (c) 4 times, (d) $\frac{1}{4}$
- 5) A Single phase 100 KVA Transformer has primary voltage of 3.3 KV. Secondary voltage is 330 V. Number of turns in primary is 1800. Then the number of turns is secondary is
(a) 90, (b) 360, (c) 180, (d) None of the above
- 6) No load voltage of a transformer is 250 V. Rated Voltage on load is 225 V. Then voltage regulation in % is
(a) 12, (b) 10, (c) 8.33, (d) None of the above
- 7) Ampere hour capacity of battery used in First AC coach is
(a) 1100 AH, (b) 450 AH, (c) 800 AH, (d) 650 AH
- 8) The capacity of power cars manufactured by ICF is
(a) 2 x 500 KVA, (b) 2 x 750 KVA, (c) 2 x 650 KVA, (d) 2 x 320 KVA
- 9) Method of speed control used in AC EMU traction motor is
(a) Series parallel combination, (b) Armature resistance, (c) Slip control, (d) tap changer control
- 10) The voltage of power supply received at SR at MRS is
(a) 11 KV, (b) 22 KV, (c) 110 KV, (d) 33 KV

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11) The capacity of inverter used in SG Pantry cars is

- (a) 2.5 KVA, 110 V dc/110 V ac, (b) 2.5 KVA, 110 V dc/230 V ac, (c) 2.0 KVA ,110 V dc/110 V ac,
- (d) 2.5 KVA, 110 V dc/415 V ac

12) Capacity of compressors used in AC DC EMUs is

- (a) 1100 LPM, (b) 920 LPM, (c) 1250 LPM, (d) 1500 LPM

13) System of braking in AC DC EMUs is

- (a) Regenerative, EP and air brake (b) only EP, (c) Regenerative and air brake,
- (d) EP and air brake

14) The C_5 rate of charging of 230 AH battery is

- (a) 23 A, (b) 69 A, (c) 46 A, (d) 60 A

15) The rating of lightening arrestor used in AC EMUs is

- (a) 32 KV, (b) 42 KV, (c) 25 KV, (d) 27.5 KV
