INTEGRAL COACH FACTORY, CHENNAI – 38.

Question Paper for selection of Assistant Electrical Engineer through Limited Departmental Competitive Examination

Paper – 1 (General)

Date: 06-10-2017

Time: 3 hrs.
Max.Marks: 150

Answer all – Each question carries 5 marks

Part-A

1   Write the full expansion of the following abbreviations: 5 marks

    i)   BRICS

    ii)   SAARC

    iii)   UNICEF

    iv)   NHRC

    v)   PGCIL

2.   Fill in the blanks: 5 marks

    i)   Light year is a measurement of _____

    ii)   Nilgiri Mountain Railway has been accorded World Heritage status by _____

    iii)   The headquarters of South East Central Railway is at _____

    iv)   "The Discovery of India" is a book written by _____

    v)   Speed of ships is usually measured in terms of _____

3.   Write briefly your understanding of the following current topics   5 marks

    a)   GST

    b)   Global warming

4.   Write the algebraic expression for   5 marks

a.   Thirty divided by seven times a number

   (1) 30/7n

   (2) 7n/30

   (3) 30(7n)

   (4) None

b.   A person's earning in d days at the rate of 30 per day

   (1) 30d

   (2) 30/d

   (3) 30+d

   (4) None

c)   The product of nine and a number, decreased by six

   (1) 9 (m-6)

   (2) 6 (a-m)

   (3) 9m-6

   (4) None

d)   Three times a number, increased by seventeen

   (1)3 (a+17)

   (2)3a+17

   (3)17+3)a

   (4)None

e   Fifteen less than twice a number

   (i)   15-2x

   (ii) 2x+15

   (iii) 2x-15

   (iv) None

5.   A & B are two complex numbers A=9+3i and B=3+9i. Work out A+B, A-B, AxB, A/B   5 marks

6.   A straight electric pole breaks due to storm and the top of the pole touches the ground making an angle at 30 degrees with the ground. The distance from the bottom of the pole on the ground to the point where the top touches the ground is 15 metres. Find the height of the electric pole.   5 marks

7.   A resiistance of R Ohms, inductance of X Henries and capacitance of C Farads are connected in series and an AC voltage is applied across the circuit. Derive expressions for (i) Resistance frequency (ii) voltage across inductance (iii) voltage across capacitance   5 marks

8.   One pipe can fill a tank in 40 minutes. Another pipe can empty it in 60 minutes. If both pipes are opened at the same time, how much time will be taken to fill the tank.   5 marks

9.   A passenger train running at 80kmph leaves a station 6 hours after a goods train leaves and overtakes it in 4 hours. What is speed of goods train   5 marks

10.   Write short note on the functions of Committee on Official Languages, as per the Official Languages Act, (1963)   5 marks

Part-B

Answer all questions. Each question carries 10 marks

1.   A moving coil instrument has a resistance of 10 ohms & gives full scale deflection when carrying current of 50 mA. Find the value of shunt required in Ohms to convert the instrument into an ammeter of range 100 A   10 marks

2. a.   What is regenerative braking? What are conditions necessary to achieve electric regenerative braking?

    b.   Explain two Watt meter method for measuring three phase power   10 marks

3.   Draw family of Torque – slip curves with increasing values of rotor resistance in motoring mode. Also draw a separate curve showing braking, motoring and generating mode for a fixed rotor resistance.   10 marks

4. What are various methods of speed control of D.C. series motors? Explain briefly. 10 marks

5. A four pole, 3 phase induction motor operates from a supply whose frequency is 50 Hz. 10 marks

   Calculate:

   i) speed at which magnetic field of stator is rotating

   ii) speed of rotor when slip is 0.04

   iii) frequency of rotor currents when slip is 0.03

   iv) frequency of rotor currents at stand still

6. Three Resistors A,B and C are connected in parallel as shown in the figure below and take a total current of 7.9 Amps. R_A = 48 Ohms and takes 2.5 Amps, I_B = $2I_C$. Calculate (i) I_B and I_C (ii) the line voltage and (iii)) R_B and R_C. 10 marks
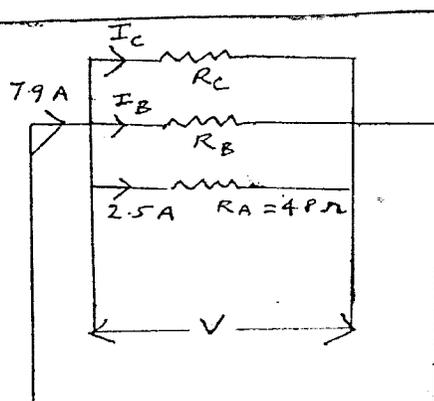
7. A 3-phase motor operating on a 440 Volt, 50 Hz supply system is developing 50 KW at an efficiency of 90% with a Pf of 0.8. Calculate the (i) line current and (ii) phase current if the windings are delta connected. 10 marks

8. Explain the salient features of Indian Electricity Act, 2003 and explain the role of Central Electricity Authority (CEA). 10 marks

9. a. Explain how magnetic materials are classified? 10 marks

   b. What is magnetic hysteresis? Explain it with a B-H curve

10. Explain in detail about various examinations held under the Rajbhasha policy and availability of incentives for passing those examinations. 10 marks

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Paper-I (General)
Addendum

Date:6-10-2017

Time:3 hrs.

Max.Marks:150

Part-A

Answer any 10 questions

7. ' Resistence' frequency to be read as **'Resonance'** frequency

11. Find out the values of sin 105 and cos 15 using formulae   **5 marks**
for sin and cos of sum/difference of angles.

Part-B

Answer any 10 questions

11.   a)   What are the different methods of starting squirrel   **10 marks**
cage induction motors?

      b)   What is the procedure for paralleling Transformers