**QUESTION PAPER FOR SELECTION FOR GROUP-B**
**ELECTRICAL DEPARTMENT ECR**
(Paper on Professional subject, Establishment and Financial Rules)

**1. a) In the circuit calculate the value of 'V'**
**b) What is the importance of earthing in electrical systems? Explain with suitable examples.**
**c) In your own field of posting, what efforts you have made/can be made for energy conservation ?**
**d) As AEE what will be your priority areas if you are posted as AEE/TRD or AEE/G or AEE/TRS in the division?**
**e) Write short note on – (i) Tap changer (ii) Lightening arrestors (iii) Condition monitoring of equipments (iv) Advantages/disadvantages of DC supply.**
**2. a) In WAG5 loco, battery capacity is _____AH**
**b) Battery capacity of BG 110V, TL coach is _____AH**
**c) Minimum height of contact wire at a LC gate is _____**
**d) EIG sanction is given by _____in the Railways.**
**e) the KVA rating of WAG7 loco transformer is _____**
**f) The condemning dia of OHE (25KV) contact wire is _____**
**g) Minimum clearance from ground level of LT overhead conductor at road crossing is _____ feet.**
**h) _____ gas is used in circuit breaker, as a medium of insulation in arc chamber.**
**i) Pressure setting of RGCP to cut off compressor in a WAG5 loco is ____kg/cm2**
**j) Cut in speed of 25 KW alternator in AC coaches in _____ r.p.m.**
**k) Minimum implantation of OHE mast in a BG line which CEE can condone is ____.**
**l) Length of overlap type neutral section is _____m.**
**m) High speed WAM4 loco has gear ratio of _____**
**n) Priming is required for _____type pump.**
**o) A 1000W heater used for 6 hours daily, will consume ____units of electricity in 300 days.**
**p) Under normal circumstances minimum permissible dia of WAG5 loco wheel is _____mm.**
**q) _____relay acts in TSS when neutral section is bridged.**
**r) High creapage path bracket insulator has creapage distance of _____mm.**
**s) _____ value in pneumatic circuit comes into play for multiple operation of loco.**
**t) New temperature setting for summer for AC coach is _____to _____0C**
**u) _____is used for measuring insulation resistance.**
**3. Why scheduled maintenance is necessary for an equipment? Elaborate in detail as to how the periodicity of different schedules is fixed for any equipment at initial stage.**
**4. What is the function of Q118 in a WAG5 loco. Explain in detail with sketch/diagram.**
**OR**
**What is ATD and what is its function in OHE system? Which type of ATD's are used in Indian Railways?**
**OR**
**Draw a typical schematic layout of a 11KV/440V substation with two transformers of 1000 KVA each and one 500 KVA DG set. Show various protection devices and explain their purpose.**
**5. What do you understand by HOER? What are the different classes under HOER. Explain them & give one example of each class.**
**OR**
**a) When and why do we celebrate Hindi-day?**
**b) As per official language act, Orissa comes under which category.**
**c) How many documents are included in section 3(3) of official language act?**
**d) What will be the sequence of a signboard has to be made in Tri language in Orissa area**
**6. Write short notes on the following.**
**a) Zero based Budget**

**b) Liability Register**
**c) Material Modification**
**d) Budget Estimate**
**e) Relays & give any two example of use in Railway**
**7. a) To ensure use of Hindi as per laid down targets in official work, at what different places check points have been established.**
**b) Why do we celebrate Hindi Week?**
**c) What do you understand by an employee with fluency in Hindi.**
**d) What are the three main Hindi exams conducted for Railway staff for proficiency in Hindi?**
**8. What do you understand by energy conservation? Why it is necessary? For electric energy conservation & reduction in electric energy bills in Railway both for traction and non traction, what steps would you suggest in the field of electric general services, locomotive maintenance and operation and TRD?**
**9. A) Fill in the blanks**
**i) In RMPU type ACCW _____ no AC plants are there.**
**ii) In TL coach _____ electric circuits are provided in Jn. Box.**
**iii) _____no. of V bolts are there in one SG ACCW**
**iv) G-jumper in conventional OHE overlap has ____ no PG clamps**
**v) Minimum Horizontal permissible clearance of 25 KV OHE from any structure is _____mm.**
**vi) In conventional main line AC-OHE equivalent copper area of OHE is ____mm2**
**vii) Permissible flange and root wear in WAG5 loco is ___ & ____mm.**
**viii) BDV of EHV grade transformers oil for loco should be above _____KV.**
**B) What maintenance schedules are done on TL coaches?**
**C) What maintenance schedules are done on an WAG5 loco and at what interval.**
**D) What is the POH schedules at what interval it is done for AC OHE?**
**10. A) Draw a neat sketch of an overlap type neutral section (plan & elevation) showing clearance & stagger**
**B) What is autoregression in an electric loco? Draw a relevant control chat of WAG5 loco and explain various reasons of autoregression. Also explain in detail different circumstances of its happening.**
**C) What are the various types of pumps normally used? Briefly give their specific applications with merits and demerits.**
**11. A) Third rail traction current collection system.**
**B) Advantages of MEMU over conventional train for suburban section.**
**C) What is wheel Flange Lubricator(WFL)? For what is used and where?**
**D) What is the purpose of underslung Inverter in AC coaches. Write its advantages also.**
**E) What is defrosting in refrigerator and Air Conditioner system? Write what are the various methods of doing it?**
**F) What is Lux levels recommended by Railway Board for A, B & C category of stations. Explain the categorization A, B & C also.**
**G) What steps can be taken to reduce cost of electrification on Indian Railways.**
**H) What is 3Q electric loco? Write its merits and demerits over conventional AC loco.**
**I) What is dynamic and regenerator brakings? Write merits and demerits of the two.**
**J) What steps are needed to be taken by electrical department to achieve "Mission 700 Million tonne freight loading and beyond.**
**12. A) Which International Agency has been elected for Nobel Peace Prize 2005?**
**B) Sonia Mirza is from which city?**
**C) Who is the Chairman Railway Board?**
**D) Indian Railway carried how much originating revenue loading during 04-05?**
**E) Between which stations & under what zones Indian Railway has planned to run trains at 150 kmph shortly.**
**F) Which plant is used for making Bio-Diesel**
**G) Which other Asian country along with India is bidding for permanent seat in UN Security council?**

**H) Write full term of IRCON, CRIS, COFMOW & DMRC**
**I) Recently in what connection word Katrina was in the news?**
**J) ECoR's jurisdiction covers how many states of India?**
**K) Which station is having longest platform on Indian Railways?**
**L) What is IRWO? What are its objectives?**
**M) Name any four public sector undertaking of Ministry of Railways.**
**N) "Indian Railway is spending adequately on Human Resource Development (HRD)". Give your views in favour and against.**
**13. a) what are the different classification of Insulation? Give max. temp. permissible for each class. Give the 4 names of insulating materials for each class.**
**b) An electric ckt has a resistance of 20 , inductive reactance of 35 and capactive reactance of 20 . Find the impedance of the circuit.**
**c) In the circuit find out I.**
**d) An induction motor has 6 poles and operates on 60Hz supply. If the speed of the rotor at full load is 1190 rpm what is the slip?**
**14. a) What is meant by power factor? What is the harm if power factor is low? What are the causes of low power factor? How would you calculate the capacity of the condenser required to improve the power factor. One load consist of 50KVA lighting load & a 300HP induction motor load working at 75% average load at 0.8 P.F. I f power factor is to be improved to 0.95, calculate the requirements of condenser in terms of KVA.**
**b) What do you understand by low, medium, high and extra high voltages? What is the maximum permissible limit of variation of the voltages and frequency of electric supply as per IE rules.**
**c) The current in an AC circuit is given by i=100 Sin 314t amperes. What is the maximum value of current & frequency of the current.**
**15. a) What are the desirable characteristics of a traction motor? Explain with the help of speed tarque curve of a AC series motor as to how does it fulfill these requirements. What developments has made induction Motor popular for traction purposes now. Explain.**
**b) What are the common causes of ball bearing failures? Given the list of Do's & Don'ts preventing ball bearing failures.**
**c) "Electric short circuit is a common cause of fire" – Give your comments in f avour & against the above.**
**d) Give steps you will take to investage the cause of fire in a room having electric s upply.**
**16. a) Fill in the blanks**
**i) A moving coil permanent magnet instrument can be used as _____ by using a low resistance shurt ____**
**ii) Natural air cooling and natural oil cooling is used for transfers upto ____ rating.**
**iii) Energy stored in the electric field of a capacitor 'C' when charged from a DC source of 'V' volt will be _____Joules.**
**iv) Two transformers operating in parallel will share the load depending upon their _____**
**v) IGBT stands for _____**
**B) Draw a neat diagram of stair case wiring**
**C) Calculate the resistance of a wire whose length is 4 times and cross sectional area twice of the wire whose resistance is 20 . Material of two wires is same.**
**D) A battery produces a current of 6 Amps when external resistance of 2 is connected across it. It produces 2 Amps current when 12 is connected. Find its internal resistance and EMF.**
**E) Write short notes on**
**i) HVDC**
**ii) Earth resistance measurement**
**iii) Non conventional sources of energy**
**iv) IE rules**
**v) Electricity Regulatory Commission**
**17. Write short notes on following**
**a) Benchmarking**

**b) Assured Carrier Progression**
**c) PREM**
**d) PNM**
**e) Quarantine Leave**
**18. Fill in the blanks**
**a) JE-I is a _____post (selection/non selection)**
**b) Chowkidar is classified as _____category under HOER.**
**c) Abbreviation DCRG stands for _____**
**d) An employee is eligible for _____days of medical leave per year**
**e) SF-1 form is used for _____**
**19. Give step by step procedure for imposing major penalty. Mention time limit for each stage.**
**20. Fill in the blanks**
**a) Primary unit no _____is meant for contractual payments.**
**b) Other electrical works (OERW) are sanctioned under plan head No._____**
**c) Traction energy bills are charged to demand No._____**
**d) Normally an Assistant officer should conduct ____% test check on works being carried out on contract.**
**e) Audit note part-I, if not properly replaced get converted to _____**
**21. Write short notes on following**
**a) Revised Estimate**
**b) Preliminary Works Programme**
**c) SRSF**
**d) Operating Ratio**
**e) Zero based Budget**
**22. What do you understand by remunerativeness of a project as per financial code?**
**23. What is the demand No. & Minor head for the following**
**i) Repair & maintenance of plant & Equipment –electrical**
**ii) Repair & maintenance of C&W-Electrical General Services –TL, fans & airconditioning**
**iii) Motive Power Maintenance – Electric Loco**