

2013

Model Question Paper

for selection of

Instructor for

STC/KGP

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Sr. Lecturer** / STC under PSTC/KGP against WPO/KGPW's letter No.1287/Panel/ STC & BTC/3197 dated 05-09-2013

Date of Examination:

Duration: 3 Hours

Maximum Marks: 100

Part-A

- Q1. Fill in the blanks with appropriate comments: 1 x 25 = 25
- i. NSR No. Bears-----digit number.-
 - ii. Consignee code bears ----- digit numbers
 - iii. PL No. bears -----digit number.
 - iv. Budget estimate is prepared in the month of -----
 - v. Power of CME to sanction M&P item up to Rs.-----
 - vi. There is a provision of Child Care leave for an woman employee for a total period of 730 days in her entire period of service.
 - vii. Standard Form No. ----- is used for issuance of Minor Penalties.
 - viii. Expanded form of MACP is -----
 - ix. There are ----- sections in O.L Act
 - x. Section ----- of O.L. Act is related with Bilingual (Hindi & English) use
 - xi. Moment of inertia of a hollow sphere having mass "M" and radius "R" about an axis passing through its centre is ----
 - xii. ----- Cycle has the maximum efficiency among all thermodynamic cycles under the same temperatures limit
 - xiii. A member of a machine which transmits power without any deformation is called -----
 - xiv. Dimensional unit of surface tension is -----
 - xv. Pressure tubes are generally joined by ----- welding
 - xvi. Welding process, where two pieces of metal of same cross section are gripped together and pressed while heat is generated in the contact surface is called-----
 - xvii. Universal chuck comprises-----no of jaws.
 - xviii. Nitriding is a ----- process of heat treatment.
 - xix. Ideal fluid offers -----resistance against shear force.
 - xx. Power delivered by the engine is the product of velocity and -----
 - xxi. A metal is said to be cold worked if it is mechanically processed below -----
 - xxii. During gas cutting process, metal is cut due to -----of O₂
 - xxiii. Full form of DVD is -----
 - xxiv. MS-Word is an word processing -----
 - xxv. 101010 in binary number system is equivalent to ----- in decimal number system
- Q2. State the following whether "TRUE" or "FALSE". 1 x 25 = 25
- i. Frequency of verification for "A" category item under ABC analysis is 1 year.
 - ii. The degree of control should be rigorous for "A" items & should be minimum for "C" item items.
 - iii. S1 No. 2g (Works matter) of USOP deals with the sanction of Estimate for Sanctioned work.
 - iv. CPDE is to publish notification of Open Tender in Railway.
 - v. At Railway Board level, PNM is held once in four months.
 - vi. The staff excluded is eligible for night duty allowance.
 - vii. All name plates, sign boards, letter heads, inscriptions on envelopes and other stationery etc., shall be in bilingual.
 - viii. Expanded form of HOER is Hour of Employment Rules.
 - ix. New pension scheme has been started from 01-01-2006.
 - x. As per O.L. regions in India, West Bengal is in "B" region.
 - xi. Devnagari is the script of Hindi
 - xii. Hard disk is an example of primary memory unit.
 - xiii. MS-Office is operating system software.

- xiv. Otto cycle comprises two isobaric processes and two isothermal processes.
- xv. When length of the simple pendulum tends to infinity, its time period also tends to infinity.
- xvi. A spring is cut into three equal pieces and found spring constant of each spring $1/3^{\text{rd}}$ times that of original spring constant.
- xvii. Surface tension tries to minimize the surface area.
- xviii. As the percentage of carbon in steel increases, critical temperature decreases.
- xix. Inclusion is a welding defect.
- xx. Mechanical advantage for lifting water with pulley rope arrangement is less than 1
- xxi. GM can sanction RSP item up to Rs 10 lakh
- xxii. Magnetite is carbonate ore of iron.
- xxiii. Power required by an water pump is directly proportional to square of the velocity of discharge.
- xxiv. Compression ratio for diesel cycle is 4:1
- xxv. Rolling friction develops due to mechanical interlocking between two contact surfaces.
- xxvi. The moment of a force about an axis is vector.
- xxvii. xxvii) In SHM, frequency of maximum K.E. is twice that of the frequency of the cycle.
- xxviii. xxviii) Buna-S is a polymer of Natural rubber.
- xxix. xxiv) Composite brake block is introduced to increase the life of brake blocks.
- xxx. xxv) Specific Fuel Oil consumption indicates the overall health of Diesel engine.

Part-B

Answer any five questions from the following:

10 x 5 = 50

Q3. How will you comply with the following.-

- a) A mild steel shaft is to be made into power transmitting shaft.
- b) Density of steel ingot is to be increased.
- c) Seamless copper pipe has been hardened and it is to be put into service.
- d) Metal surface is to be made very smooth reflective surface.
- e) 1000 Kgf load is to be lifted by an effort of 10 Kgf.

Q4. Write short notes on the followings:

- a) MIG welding
- b) Piercing.
- c) Polymer .
- d) Babbit metal
- e) Metacentre

Q5. Explain different processes involved in Carnot Cycle and utility of this cycle. Also explain Why it is a theoretical cycle?

Q6. Explain the objectives of lubrication. Describe any two types of lubrication system.

Q7. Describe the following heat treat processes:

- a) Annealing.
- b) Normalising.
- c) Hardening.
- d) Tempering
- e) Nitriding

Q8. What do you mean by viscosity? How does viscosity play a significant role in lubrication?

In the light of viscosity, describe terminal velocity of a body moving in a viscous fluid.

Q9. Normal reaction acting on the wheels of a coach is 1000Kgf when it is at rest. This reaction force shifts forward and makes an angle of 60° with the horizontal when the coach is in forward motion. Calculate the rolling friction experienced by the coach.

South Eastern Railway
Mechanical department

Sub: Model Q P for examination against filling up of ex-cadre post of **Sr. lecturer (Establishment)** for STC/KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks: 100

03 hours

Section-A

Q.1. Expand the following abbreviations:-

20 Marks

- (a).P.E.T (b). M.A.C.P.S (c). R.E.L.H.S (d) R.V.N.L (e).P.R.E.M
(f). H.O.E.R (g). D.B.M.S (h) C.O.F.M.O.W (i) S.L.P (j). A.F.R.E.S

Q.2. Fill in the blanks:

15 marks

- (a).CGEIS had come in to force with effect from -----
(b).The term 'retrenchment' is defined in ----- Act
(c). In all recruitment grades, probation period is-----
(d). The quantum of pension available to the old pensioners shall be increased by -----%
Of basic pension, if the age of pensioner is between 85 years to less than 90 years.
(e) Women employees having minor children may be granted child care leave by an
authority competent ----- to sanction.
(f). ----- Script has been adopted for the official language of the Union.
(g). Any new face substitute should be appointed only with the prior personal approval of -----
(h). A Railway employee desires to apply for a post in a private concern, he should first offer to
----- from Railway service.
(i). Hospital Leave shall be granted to a railway servant other than -----
(j). Payment of compensation shall be made through ----- in respect of a workman whose
injury has resulted in death.
(k). The general principles that may be followed in determining the seniority of non-gazetted
Railway servants are enumerated in Chapter -----of the IREM, Vol.I.
(l). Maximum marks allotted in selections to posts within Group C for record of service shall be

(m). Withdrawal from PF on marriage account may be granted as a special case up to ----- months
emoluments in the case of marriage of a female.
(n). Railway servants employed in a confidential capacity are classified as -----as per HOER
(o). Attendant means ----- as per pass rules.

Q3. Write true or false

15 marks.

- (a). A supernumerary post, on vacation by the incumbent, can be filled by another officer in the
order of seniority.
(b). At Railway Board level, PNM is held once in four months
(C) Joining time is admissible to an employee on temporary transfer
(d). Principles of averaging will not apply to Running staff
(e). The staff excluded are eligible for night duty allowance
(f). An employee removed from service is entitled for pension
(g). All post retirement complimentary passes issued to the eligible Indian Railway personnel
would be valid over Konkan Railway.
(h). All name plates, sign boards, letter heads, inscriptions on envelopes and other stationery etc., shall
be in bilingual
(i). A railway servant is not entitled to HRA if his spouse is allotted with Government
accommodation at the same station.
(j). If the documents cited in the charge sheet are not enclosed to it at the time of serving the
same, it shall lead to procedural lapse.
(k). When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed.
(l). Trade Union member can act as Defense counsel in a DAR case against Gazetted Officers.
(m). Withholding of increments for failure to pass any departmental examination is not a penalty under
D& A Rules, 1968
(n). Loco Running sheds are factories within the meaning of Factory under Factories Act, 1948
(o). Medical allowance is granted @ Rs. 300/- p.m. to Railway Pensioner/Family Pensioner
residing beyond 2.5km away from Railway Hospitals.

Section B

Answer any five of the following:

10x5=50 Marks.

Q.1 A Chief Office Supdt., whose pay Band and Grade Pay are Rs.21940/- and 4600 respectively with effect from 01.07.2012, retires from service on attaining the age of superannuation on 31.05.2013.

He has rendered 38. 1/2 years of qualifying service. Please workout the following

- (a). Monthly Pension & family Pension
- (b). Retirement Gratuity
- (c). Commutation of pension (Commutation Value is 8.194)
- (d). Encashment of LAP assuming that he has 300 days of LAP on the date of his retirement.

Q.2. What are the provisions of the Official Language Rules 1976 regarding communications between various central government offices.?

Q.3. What are the entitlements of Gold, Silver and Bronze pass holders under pass Rules?

Q.4. What is the procedure for imposing of Major penalty under Rule 9 of DAR 1968?

Q.5. Mention any 10 (ten) Acts names under Labour- Laws ?

Q.6. What are the various relaxations/concessions available to candidates belonging to SC/ST communities in direct recruitment?

Q.7. Answer any two of the following:-

- (a). Mention any five situations where HRA is not payable to an employee?
- (b). Indicate any five categories of non-technical posts for which direct recruitment is done through RRB and for which minimum qualification is graduation.
- (c). What are the duties and powers of the appellate authority under RS(D&A) Rules, 1968?

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Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Ch. Instructor (Electrical)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

(Answer Q.No 1,2&3 and any five from rest Question)

1.Fill in the blanks.

20x1=20

- a) Maximum permissible earth resistance for domestic installation is _____.
- b) Pump capacity is expressed in _____.
- c) For electrical fire the type of fire extinguisher to be used is _____.
- d) The statutory limit of voltage variation in consumer terminal is _____.
- e) The commutator segments of a DC motor are made of _____ material.
- f) Silicon steel is commonly used for armature core because of _____ & _____.
- g) A consumer is connected to the distributor by means of _____.
- h) _____ of each railway zone acts as the electrical inspector to the GOI for the railways.
- i) As per ER, the minimum clearance of the lowest conductor from the ground is _____.
- j) The MFO of TL coach alternator is _____.
- k) Soft solder is an alloy of _____ & _____.
- l) The PCD of AC coach alternator pulley is _____.
- m) 1 Ton of refrigeration is equal to _____ Kcal.
- n) The chemical formula for R134 is _____.
- o) The input of RMPU Inverter is _____ V DC and output is _____ V DC.
- p) The type of expansion device used in room air conditioner is _____.
- q) The pH value of DM water is _____.

2) Answer briefly

10x2=20

- a) What is priming?
- b) What is pre cooling?
- c) What is gimbal ring?
- d) What are the indications of a fully charged cell?
- e) What is EFT?
- f) What is IGBT?
- g) What is VRLA?
- h) What are the usage of Auto Transformer?
- i) What is relative humidity?
- j) What is Vane relay?

3) Write True or False

10x1=10

- a) PTFE stand as Poly Tetra Fluoro Ethylene.
- b) The Curri temperature of Iron is 1400°C
- c) Blow Out coil is used in electrical contactor for extinguish the arc.
- d) Max. Permissible temperature rise of H class insulation 200°C .
- e) In BDV test two electrodes are adjusted to 5 mm gap.
- f) For computer memory /Transformer core hard magnetic materials are used.
- g) Main disadvantage of Auto transformer is, it cannot be used where transformation ratio is _____
- h) smaller than one.
- i) Buckling is one of the defects of lead acid battery.
- j) Trickle charging is 15% of normal charging rate.
- k) Specific gravity of fully charged cell is 1200.

- 4) Classify the insulating material on the basis of their thermal stability in service. Also describe the various insulating materials used for manufacture of transformer. 10
- 5) Explain the advantages and disadvantages of commonly used pumps in railways. 10
- 6) Explain the working of the vapour compression system in room air conditioners. 10
- 7) Write short notes on – a) Evaporator b)ERRU 10
- 8) Write the maintenance practices to be adopted for TL batteries. 10
- 9) Draw a schematic diagram to show the power distribution in a 11/0.4 kv sub-stn. 10

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Ch. Instructor (C&W)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Group-A (Objective Questions)

Answer all questions

1. Fill in the blanks 1x20=20
- a) The maximum air pressure required for WRA is _____ kg/cm²
 - b) Prescribed leakage rate while conducting leakage test on a coach is _____
 - c) The working strength of CBC used on coaches is _____
 - d) The lateral clearance between side frame and axle box adopter casnub 22 W is _____
 - e) The brake cylinder vent plug is used for _____.
 - f) "C" class ODC shall be moved during _____
 - g) The water tank capacity of ICF coach is _____ litre
 - h) The condemning limit of BLC wagon wheel diameter is _____
 - i) The side bearer used in BLC wagon is _____
 - j) The diameter of LHB Bk. Cylinder is _____
 - k) The quantity of oil in each side bearer of an ICF trolley is _____
 - l) The amount of grease in an axle box of spherical roller bearing is _____
 - m) The working strength of CBC used on coaches is _____
 - n) The lateral clearance between side frame and axle box adopter casnub 22 W is _____
 - o) The brake cylinder vent plug is used for _____.
 - p) The size of brake cylinder in bogie mounted system is _____
 - q) The water tank capacity of ICF coach is _____ litre
 - r) The condemning limit of BLC wagon wheel diameter is _____
 - s) The side bearer used in BLC wagon is _____
 - t) The BSS hangers of an ICF bogie are fitted at an angle of _____ with vertical
- Q 2. Match the following 2x5=10
- | | |
|------------------------|-----------------|
| a) FIAT BOGIE | i) AC Chair Car |
| b) HYBRID Coach | ii) AC coaches |
| c) RMPU | iii) LHB Coach |
| d) CBC | iv) 160 Km. |
| e) Reclining Mechanism | v) Air Spring |
3. State True or False 1x20 = 20
- a) The hot box temperature is 80 degree centigrade.
 - b) The number of roller provided in each row CTRB is 24
 - c) The root radius of worn wheel profile used on CASNUB bogie is 13 mm
 - d) Brake cylinder charging time in coaching stock during full service application is 3 to 5 sec
 - e) The standard gap between wheel and brake block in BOX wagon is 6.25 mm
 - f) The BSS hangers of ICF bogie are fitted at an angle with the vertical is 10degree.
 - g) The number of roller provided in each row CTRB is 24
 - h) The root radius of worn wheel profile used on CASNUB bogie is 13 mm

- i) Brake cylinder charging time in coaching stock during full service application is 3 to 5 sec
- j) The standard gap between wheel and brake block in BOX wagon is 6.25 mm
- k) Frequency of verification for "A" category item under ABC analysis is 1 year.
- l) The degree of control should be rigorous for "A" items & should be minimum for "C" item items.
- m) SI No. 2g (Works matter) of USOP deals with the sanction of Estimate for Sanctioned work.
- n) CPDE is to publish notification of Open Tender in Railway.
- o) At Railway Board level, PNM is held once in four months.
- p) The staff excluded is eligible for night duty allowance.
- q) All name plates, sign boards, letter heads, inscriptions on envelopes and other stationery etc., shall be in bilingual.
- r) Expanded form of HOER is Hour of Employment Rules.
- s) New pension scheme has been started from 01-01-2006.
- t) As per O.L. regions in India, West Bengal is in "B" region.

Group-B

Answer any five of the following

1. (a) What are the salient features of Air Suspension system ?
 (b) Draw a schematic diagram of air suspension system and label its parts.
 (c) Compare the helical spring with the air spring 4+4+2
2. (a) List out a comparative feature/technical data of ICF and LHB coaches.
 (b) How heat and sound is managed in LHB Coaches ?-roll mechanism fitted in LHB coaches ?
 (c) Write down the symptoms and causes of hot axle ? 6+2+2
3. (a) What do you mean by ODC ? Classify the different classes of ODC with their salient features.
 (b) What is the examination pattern of CC rake ? 5+5
4. Write short notes on the following (any four)
 (a) IRCA (b) DRS card (c) Special repair (d) WILD (e) OBHS $4 \times 2\frac{1}{2} = 10$
5. (a) Why BLC wagons are introduced in Indian Railway ?
 (b) What are the special features of BLC wagon ?
 (c) What do you mean by slackless couplers ? 2+6+2
6. (a) How is LOCO leakage test done ?
 (b) What are the procedures of train leakage test ?
 (c) How the LOCO compressor capability is tested ? 3+4+3
7. (a) What are the precautions to be followed while maintaining the bogie mounted brake system?
 (b) Draw a schematic diagram of air suspension system and label its parts. 5+5=10
8. (a) What do you understand by Trammel gauge? How would you check Casnub trolley with this gauge ?
 (b) What is the examination pattern of CC rake ? 5+5 =10
9. (a) Why are 'L' type and 'K' type brake blocks not interchangeable? Give your answer in detail.
 (b) What are the special features of BLC wagon ? 5+5=10
10. (a) What are the precautions to minimize the incident of train parting for CBC ?
 (b) What are the various types of wheel defects and how can these be checked ? 5+5=10

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Ch. Instructor (Diesel/Mech)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

- Q.1 (A) Fill in the blanks with appropriate comments 1x 25 =25
- a Main bearing stud is to be discarded beyond the length of -----
 - b Main objective of using Turbo supercharger in Diesel Locomotive is to increase -----
 - c ----- lubrication system is provided for lubricating suspension bearing of Diesel locomotives (WDM₂)
 - d Middle layer of crank shaft main bearing contains , and.....
 - e As the temperature of engine increases, viscosity of Lube Oil-----.
 - f High exhaust temperature is the indication of
 - g Injection Pressure of fuel oil is made high for atomization of oil and ----- against compressed air
 - h Atomization of fuel is required to increase ----- Of fuel for Oxygen to react
 - i Inner surface of liner is made -----
 - j In turbo supercharger pressure of intake air is increased due to.....
 - k For cooling Diesel Locomotive components, water is supplied to the components indirection
 - l With in the compressor crank case block, both negative and positive pressures are generated. They are and
 - m Hardness of cam lobe must than that of cam roller
 - n Inner diameter of liner sleeve must bethan outer diameter of Liner
 - o Hardness of Split gear key must be than that of the crank shaft.
 - p Torque required for tightening Fuel "T" jumper bolt is -----
 - q POH of Locomotive is carried out after every -----Years
 - r Crank vacuum is measured by
 - s Baffle plates are provided inside the Fuel oil tank to reduce -----
 - t Surging effect may Turbo Super Supercharger.
 - u Stores which leave no residue after use are termed as -----
 - v NSR No. Bears-----digit number.
 - w Plan Head-17 deals with -----
 - x Primary Unit-28 deals with expenditure against -----
 - y Allocation for purchasing of New Machine costing Rs 9 Lakh is -----
- Q.1 (B) Write "True" or "False" 1x 25 =25
- a Devnagari is the script of Hindi
 - b Regional Language is used first in writing the name of a station.
 - c Andaman, Nicobar, Island is in "A" region.
 - d Mega Bytes indicates the capacity of storage device
 - e Expanded form of ALU is Arithmetic and Logic Unit
 - f Expanded form ASCII code is American Standard Code for Information and Interface.
 - g MS-Office is an Operating System soft ware
 - h Combination of bits is called Byte
 - i Hard disk is a primary storage device
 - j There is a provision of Child Care leave for an woman employee for a total period 730 days
 - k HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
 - l When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
 - m The staff excluded are eligible for night duty allowance

n	New Pension scheme has been introduced w.e.f. 01.01.2006
o	Standard Form No.11 is used for issuance of Minor Penalties
p	Objective of Supercharging is to feed pressurized air to the engine cylinder.
q	Air-Fuel ratio for Diesel engine is 5:1
r	Tractive effort is the maximum force that can be applied by the vehicle.
s	There are 08 nos of main bearings in WDM ₂
t	Dry-Run test ensures the proper movement of fuel oil linkage
u	Load Box test ensures hauling capacity of Locomotive
v	Blow-By test ensures the sealing of combustion chamber
w	TSC comprises five numbers of casings
x	SFC ensures the overall health of Diesel Locomotive
y	Effective Dynamic brake operation increases the frequency of wheel turning

Part-II

Answer any Five from the following:

Q2. Write notes on

a) SOP, b) NSR, c) Stock Items, d) Cash imprest

Q.3. What are the advantages of super charging in a diesel engine and how is it achieved?

Q.4 What are the recent modifications being introduced in diesel locomotives from mechanical side?

Q.5 A Diesel Locomotive is experiencing a repeated Hot Engine alarms. What may be the probable causes for this trouble and subsequent remedial measures?

Q.6. Discuss necessary steps to be taken to minimize Lube Consumption in shed.

Q.7. Describe the brake application system in Diesel Loco with line sketch. Write down the function of D-1 pilot air valve and SA-9 independent brake valve?

Q.8. Define disciplinary authority. What are the various steps to be followed for finalization of major penalty?

Q.9 Write short notes on any Four (4):

a) Blow-by test of Engine power assembly.

b) Spectrographic analysis of Lube Oil sample.

c) Zyglo test.

d) Dry-run test.

e) Orifice test of fuel feed system.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Ch. Instructor (Diesel/Elect)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013
Full Marks-100 Time-3 hours

(Attempt All Questions from Gr. "A" and any Five (5) from Gr. " B"

Group – "A"

1x20 = 20

1 A) Fill up the blanks in following questions.

- a) Gear ratio of Eddy current clutch gear unit (Right angle gear box) is _____.
- b) The nominal air gap between inner and outer drum of ECC (Eddy current clutch) is _____.
- c) If two D.C. series motor connected in series from parallel, torque will be increased by _____ times than parallel.
- d) Electrical power output of a D.C. motor is _____ (When "E_b" is back e.m.f. & "I_a" armature current).
- e) TM pinion and bull gear ratio in WDP₄ loco is _____.
- f) Total no. of carbon brush in BKBL motor is _____.
- g) The gap between ECC slip rings & brush holder is to be kept _____.
- h) Generator field cover load relay operating current limit is _____.
- i) Ovality of Tr. Alternator slip rings is allowed up to _____.
- j) Tacho-generator have total numbers of magnetic poles _____.
- k) Dynamic voltage adjusted at caed no. _____.
- l) Speed recorder works by getting signal from _____.
- m) Gear ratio of WDG_{3A} locomotive is _____.
- n) Material used in positive plate of loco battery is _____.
- o) Power Setter is used in MU locomotive to _____.
- p) Positive wire no. of ECC coil is _____.
- q) In MU operation wire no 25 is used for _____.
- r) Type of Excitation used in WDS-6 locomotive is _____.
- s) Power Ground can not be removed by Driver (through MCO) if earth fault occurs in TM no./nos. _____.
- t) In Diesel locomotive, wire no 24 is used for _____.

B) Choose the correct answer.

1x20 = 20

- a) For WDG_{3A} loco, time delay period setting of TDR (during starting) (0.8 to 1.5sec / 0.8 to 1.8sec / 0.5 to 1.8sec).
- b) PCS2 sets at (4/2.8kg/cm² / 4.4/4.7kg/cm² / 4.5/4.8kg/cm²).
- c) Horse Power absorbed by Auxiliary generator of WDG₄ locomotive is (a) 12KW b) 18KW c) 22 KW d) 22.5 KW)
- d) Maximum RPM of traction motor of WDG₄ locomotive is (a) 3000 b) 3220 c) 3440 d) 3500)
- e) No. of traction motor of WDP₄ locomotive is (a) 2 b) 4 c) 6 d) 5).
- f) Maximum speed of WDP₄ locomotive is (a)120 Kmph b) 160 Kmph c) 150 Kmph d) 180 Kmph).
- g) No. of main poles in Auxiliary Generator type 3101 AY1 are (a) 4 pole b) 6 pole c) 2 pole d) 8 pole).
- h) In ECC (Eddy current clutch), clutching of inner and outer drum is through (a) Mech. Clutch b) Electrical clutch c) Magnetic clutch d) By pulley arrangement).
- i) No load voltage is checked on wire no. (a) 34G-36 b) 34-36 c) GK-2-GA d) 34E-36).
- j) If the reference voltage is more than 24.4 volts, the defects in (a) LCP b) SP c) GCR d) Pilot valve).

- k) In WW governor, the solenoid/ solenoids are energized in 5th notch is (‘A’ / ‘B’ & ‘C’ / ‘A’ , ‘B’ & ‘C’ / ‘B’ , ‘C’ & ‘D’/ no solenoid)
- l) MLR current(exciting current) in adjusted in WDM2 locomotive is (25.5v / 29.5v / 36.5v / 38.2v).
- m) Working voltage of twin beam head light is (12volts / 24volts / 32volts / 72volts).
- n) Number of FS contactors in WDG_{3A} locomotive is (6 / 4 / 2 / 0)
- o) No load voltage of WDG_{3A} locomotive is (1080-1000volts/1100-1130volts//1150-1170volts/1180-1200volts).
- p) Standard Value of Reference voltage is (21.4 volts/23.4volts/24.4volts/26.4volts).
- q) No. of pole of Axle generator is (20 / 30 / 40 / 50).
- r) Pressure setting of P₁ PCS of AFL circuit is (4/2.8kg/cm² / 4.4/4.7kg/cm² / 4.5/4.8kg/cm² / 7.5/6.5 kg/cm²).
- s) Oil Pressure is maintained WW governor is (85PSI / 90PSI / 100PSI / 115PSI).
- t) Traction Motor arrangement of WDG_{3A} locomotive is (LLR-LRR / LLL-RRR / LRR-LLR / RRR/LLL).

- C) State the following statements “True” or “False” . 1x10 = 10
- DC/DC loco is cranked by Auxiliary and Exciter generator.
 - ECS is located in control stand of the diesel locomotive.
 - TDR is energized after pick up of CK3 contactor.
 - BSR is a Battery Supply Relay.
 - Trip current rating of MB₂ circuit breaker is 150 amps.
 - PCS2 picks up at 4.0/2.8 kg/cm².
 - In D.C. series motor, If load is increased, speed will also increased.
 - In D.C. shunt motor, If load is decreased, speed will also increased.
 - In D.C. series Generator, generated voltage is always constant.
 - Speed of D.C. can be controlled by changing armature resistance.

Group – “B”

Attempt any Five (5) Questions (All questions carry equal marks). 10 X 5 =50

- What do you mean by transition for Diesel loco? Why does it necessary? How does it achieved in WDG3A locomotive – explain with proper diagram. 2+2+6=10
- Enumerate construction and overhauling procedure of traction motor used in Diesel locomotive. 3+7=10
- What are the sensors, fitted in MEP-660 control system, describe about these sensors. 1+9=10
- Enumerate the construction and working procedure of Micro Controller Based Governor. 4+6=10
- Describe the Electrical power transmission system of EMD (WDG4) locomotive with the help of necessary diagram. 10
- Write short note on any two (2). 5 X 2=10
 - IGBT
 - TCC
 - Pre-lubrication (MEP-660)

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Ch. Loco Instructor (Simulator)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Date of Examination:

Duration: 3 Hours

Maximum Marks: 100

- Q. 1. Choose the most appropriate answer. 10 X 1=10
- a) LHAP available in a year a)10 days b) 20 days c) 25 days d) 30 days.
 - b) Ignition quality of diesel is expressed by a) betane no. b) cetane no. c) octane no. d) PL no.
 - c) Diesel engine ignited by a) governor. b) spark plug c)Injector d) accumulation of heat of compress air.
 - d) Cardium compound is used for a) minimizing friction b) maintain longevity c) maintain thermal stress (d) all of the above.
 - e) Codal life of WDM-2 locomotive is a) 34 yrs b) 35 yrs c)36 yrs d)42 yrs.
 - f) No. of privilege pass granted to Rly officer (G) is a) 3 set b) 4 set c) 5 set d) 6 set.
 - g) Atmospheric press at sea level is a)1.30 kg/sq.cm. b)1.03 kg/sq.cm. c) 1.13 kg/sq.cm. d) 1.31 kg/sq.cm.
 - h) Helical spring manufacture at a) Kapurthala b) Gwalior C) Jamalpur d) Chennai.
 - i) Wide of BG Rly is a)1676 cm. b)1667 cm. c)1677 cm. d) 1665 cm.
 - j) No of Rly zone as on the year 2012 is a) 15 b) 16 c) 17 d) 18
- Q. 2. Mark true or false. 10*1=10
- a) In WDM-2 loco there provided multistage reciprocating compressor. T/F
 - b) Confidential level staff having 12 hour duty. T/F
 - c) Potential energy of a ball whose mass M falling from a height H with acceleration A is the product of all three constraint. T/F
 - d) Inventor of steam engine was Rovart Stephenson. T/F
 - e) Chromate compound is used in water to detect leakage of the system. T/F
 - f) Major penalty charge sheet no.is SF-11. T/F
 - g) ISO located at Geneva. T/F
 - h) The term ABC analysis is under the subject 'Material Management'. T/F
 - i) Currency of green notice is 6 month. T/F
 - j) Rly Staff College is situated at Jamalpur. T/F
- Q.3. Expand the following terminology. 20x1=20
- FAX WWG LLL JCM AAR HTML CBI UGC CRIS DCF
QC CCTV BIS IRCA RITES CCRS DRF BMEP UTS CMS .
- Q.4. Write short note 5x4=20
- SFC, LWS, Lay off, Pixel, Railway servant conduct rule.
- Q.5 Explain the Semaphore arm signaling system in IR. 10
- Q.6 What is coolant ? Name a coolant used in WDM-2 locomotive ? Give a flow diagram of that coolant with detail description. 2+1+7=10
- Q.7 Explain with knit sketch of compress air system in WDM-2 loco 10
- Q.8 What do you mean by simulation ? Why Rly organization set up simulator ? Write four places in India where simulator are provided . 2+6+2=10

OR

Q 8. Fill in the blanks :

10x1 = 10

- a) Workman compensation Act recognize in the year -----.
- b) Rly Board form in the year
- c) In India at 1st steam engine manufacture.
- d) CCRS head quarter at
- e) Main element of ferrous metal is
- f) Amount of Adhesion factor of WDM-2 loco is
- g) 1 micron is equal to meter.
- h) Gradation of HSD oil is
- i) Father of Scientific Management
- j) Largest Rly. Network in the world is at

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Ch. Instructor (Running)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Date of Examination:

Duration: 3 Hours

Maximum Marks: 100

- Q. 1. Choose the most appropriate answer. 10 X 1=10
- LHAP available in a year a)10 days b) 20 days c) 25 days d) 30 days.
 - Ignition quality of diesel is expressed by a) betane no. b) cetane no. c) octane no. d) PL no.
 - Diesel engine ignited by a) governor. b) spark plug c)Injector d) accumulation of heat of compress air.
 - Cardium compound is used for a) minimizing friction b) maintain longevity c) maintain thermal stress (d) all of the above.
 - Codal life of WDM-2 locomotive is a) 34 yrs b) 35 yrs c)36 yrs d)42 yrs.
 - No. of privilege pass granted to Rly officer (G) is a) 3 set b) 4 set c) 5 set d) 6 set.
 - Atmospheric press at sea level is a)1.30 kg/sq.cm. b)1.03 kg/sq.cm. c) 1.13 kg/sq.cm. d) 1.31 kg/sq.cm.
 - Helical spring manufacture at a) Kapurthala b) Gwalior C) Jamalpur d) Chennai.
 - Wide of BG Rly is a)1676 cm. b)1667 cm. c)1677 cm. d) 1665 cm.
 - No of Rly zone as on the year 2012 is a) 15 b) 16 c) 17 d) 18
- Q. 2. Mark true or false. 10x1=10
- In WDM-2 loco there provided multistage reciprocating compressor. T/F
 - Confidential level staff having 12 hour duty. T/F
 - Potential energy of a ball whose mass M falling from a height H with acceleration A is the product of all three constraint. T/F
 - Inventor of steam engine was Rovart Stephenson. T/F
 - Chromate compound is used in water to detect leakage of the system. T/F
 - Major penalty charge sheet no.is SF-11. T/F
 - ISO located at Geneva. T/F
 - The term ABC analysis is under the subject 'Material Management'. T/F
 - Currency of green notice is 6 month. T/F
 - Rly Staff College is situated at Jamalpur. T/F
- Q.3. Expand the following terminology. 20x1=20
- FAX WWG LLL JCM AAR HTML CBI UGC CRIS DCF
SQC CCTV BIS IRCA RITES CCRS DRF BMEP UTS CMS .
- Q.4. Write short note 5x4=20
SFC, LWS, Lay off, Pixel, Railway servant conduct rule.
- Q.5 Explain the Semaphore arm signaling system in IR. 10
- Q.6 What is coolant ? Name a coolant used in WDM-2 locomotive ? Give a flow diagram of that coolant with detail description. 2+1+7=10
- Q.7 Explain with knit sketch of compress air system in WDM-2 loco 10
- Q.8 What do you mean by simulation ? Why Rly organization set up simulator ? Write four places in India where simulator are provided .
2+6+2=10

OR

Q 8. Fill in the blanks :

10x1 = 10

- i. Workman compensation Act recognize in the year -----.
- ii. Rly Board form in the year
- iii. In India at 1st steam engine manufacture.
- iv. CCRS head quarter at
- v. Main element of ferrous metal is
- vi. Amount of Adhesion factor of WDM-2 loco is
- vii. 1 micron is equal to meter.
- viii. Gradation of HSD oil is
- ix. Father of Scientific Management
- x. Largest Rly. Network in the world is at

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Instructor (Diesel/Mech)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

- Q.1 (A) Fill in the blanks with appropriate comments 1x 25 =25
- a No. main bearings are available in WDM₂ is -----
 - b Turbo supercharger in Diesel Locomotive is to increase -----
 - c Thermal efficiency of Diesel cycle is -----Petrol cycle
 - d "S"-Pipe is provided in Diesel Locomotive to lubricate-----
 - e As the temperature of engine increases, viscosity of Lube Oil-----.
 - f High exhaust temperature is the indication of
 - g Injection Pressure of fuel oil is made high for atomization of oil and ----- against compressed air
 - h Atomization of fuel is required to increase ----- Of fuel for Oxygen to react
 - i Inner surface of liner is made -----
 - j In turbo supercharger pressure of intake air is increased due to.....
 - k For cooling Diesel Locomotive components, water is supplied to the components indirection
 - l With in the compressor crank case block, both negative and positive pressures are generated. They are and
 - m Hardness of cam lobe must than that of cam roller
 - n Inner diameter of liner sleeve must bethan outer diameter of Liner
 - o Hardness of Split gear key must be than that of the crank shaft.
 - p Torque required for tightening Fuel "T" jumper bolt is -----
 - q POH of Locomotive is carried out after every -----Years
 - r Crank vacuum is measured by
 - s Baffle plates are provided inside the Fuel oil tank to reduce -----
 - t After cooler is used to cool -----.
 - u Intercooler is used to cool-----
 - v NSR No. Bears-----digit number.
 - w Consignee code comprises----- digits
 - x Primary Unit-28 deals with expenditure against -----
 - y Expanded form of VCD is -----
- Q.1 (B) Write "True" or "False" 1x 25 =25
- a Devnagari is the script of Hindi
 - b Regional Language is used first in writing the name of a station.
 - c Andaman, Nicobar, Island is in "A" region.
 - d Mega Bytes indicates the capacity of storage device
 - e Expanded form of ALU is Arithmetic and Logic Unit
 - f Expanded form ASCII code is American Standard Code for Information and Interface.
 - g MS-Office is an Operating System soft ware
 - h Combination of bits is called Byte
 - i Hard disk is a primary storage device
 - j There is a provision of Child Care leave for an woman employee for a total period 730 days
 - k HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
 - l When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
 - m The staff excluded are eligible for night duty allowance
 - n New Pension scheme has been introduced w.e.f. 01.01.2006
 - o Standard Form No. 5 is used for issuance of Minor Penalties

p	Objective of Supercharging is to feed pressurized air to the engine cylinder.
q	Air-Fuel ratio for Diesel engine is 5:1
r	Tractive effort is the maximum force that can be applied by the vehicle.
s	There are 09 nos of main bearings in WDM ₂
t	Dry-Run test ensures the proper movement of fuel oil linkage
u	Load Box test ensures hauling capacity of Locomotive
v	Blow-By test ensures the sealing of combustion chamber
w	TSC comprises five numbers of casings
x	SFC ensures the overall health of Diesel Locomotive
y	Effective Dynamic brake operation increases the frequency of wheel turning

Part-II

Answer any Five from the following:

10x 5 = 50

Q2. Write notes on

- a) SFC, b) Non-Stock Item , c) CPU , d) Statistical failure

Q.3. What are the advantages of Air brake system over Vacuum brake system? Describe Independent brake system employed in Diesel Locomotive.

Q.4 What are the recent modifications being introduced in diesel locomotives from mechanical side?

Q.5 What is preventive maintenance? Describe in details the items to be taken care of during carrying out M2 Schedule on Diesel Locomotive.

Q.6. Describe the necessary precautions are to be taken to minimize the failure against Hot Engine trouble in Diesel Locomotive .

Q.7. Why is Load box test conducted and describe the procedure of Load box test.

Q.8. Describe with net sketch the Lube oil system incorporated in Diesel Locomotive.

Q.9 Write short notes on any Four (4):

- a) Blow-by test of Engine power assembly.
- b) Over speed device .
- c) Zyglo test.
- d) Dry-run test.
- e) Orifice test of fuel feed system.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Instructor (Diesel/Electrical)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

Group – "A"

1x20 = 20

1 A) Fill up the blanks in following questions.

- a) PREM stands for _____.
- b) Maternity leave for female Railway employee is granted for _____ days.
- c) _____ will act as Chair Person of Ad-hoc Tribunal.
- d) Total nos. of rules in D & A rule – 1968 are _____.
- e) Provision of Penalty is mentioned in rule no. _____.
- f) Joining time is granted when transfer of two station is more than 1000 km but less than 2000 km _____ days.
- g) Child adoption leave granted for _____.
- h) Standard form is used for suspension is _____.
- i) Consignee code consist of _____ digits.
- j) Main group for scrap item is _____.
- k) Items are not issued for last one year is _____.
- l) Last digit of P.L. no called _____.
- m) Form code of requisition and issue note used in division for stock items is called _____.
- n) Contract period of C category items begins on _____.
- o) Accountal unit of liter is _____.
- p) Full for of HOER is -----
- q) An Railway employee earns LAP----- days in a year.
- r) Under O.L. act West Bengal is -----region.
- s) O. L. department belongs to Ministry of _____.
- t) Official Language Act was passed in the year _____.

B) Choose the correct answer.

1x20 = 20

- a) Gear ratio of Eddy current clutch gear unit (Right angle gear box) is (a) 1:1.312 (b) 1:1.321 (c) 1:1.231 (d) 1:1.213
- b) The nominal air gap between inner and outer drum of ECC (Eddy current clutch) is (a) 0.8 to 1.2mm (b) 1.9mm to 2 mm (c) 2mm to 3 mm (d) 9mm to 4mm
- c) If two D.C. series motor connected in series from parallel, torque will be increased by (a) $\frac{1}{2}$ times (b) 2 times (c) 4 times (d) $\frac{1}{4}$ times than parallel.
- d) Electrical power output of a D.C. motor is (a) E_b / I_a (b) $E_b I_a$ (c) $E_b^2 I_a$ (d) $I_a^2 E_b$ (When " E_b " is back e.m.f. & " I_a " armature current).
- e) TM pinion and bull gear ratio in WDP₄ loco is (a) 18 :74 (b) 22 : 74 (c) 17 : 77 (d) 17 : 90
- f) Total no. of carbon brush in BKBL motor is (a) 2 (b) 4 (c) 6 (d) 8.
- g) The gap between ECC slip rings & brush holder is to be kept (a) 5mm (b) 8mm (c) 2mm (d) 15mm.
- h) Generator field over load relay operating current limit is (a) 30 (+.5) (b) 180 (+.10) (c) 288 (+.10) (d) 330 (+.5)..
- i) Ovality of Tr. Alternator slip rings is allowed up to (a) 0.010" (b) .002" (c) .005" (d) .006".
- j) Tacho-generator is having total numbers of poles (a) 2 (b) 4 (c) 6 (d) 8.

- k) Horse Power absorbed by Auxiliary generator of WDG4 locomotive is (a) 12KW b) 18KW c) 22 KW d) 22.5 KW
- l) Maximum RPM of traction motor of WDG₄ locomotive is (a) 3000 b) 3220 c) 3440 d) 3500 .
- m) No. of main poles in Auxiliary Generator type 3101 AY1 are (a) 4 pole b) 6 pole c) 2 pole d) 8 pole.
- n) Material used in positive plate of loco battery is (a) Pb (b) PbO₂ (c) Zn (d) Cu.
- o) Power Setter is used in MU locomotive to (a) Increase acceleration (b) save fuel (c) save time (d) Decrease speed.
- p) Positive wire no. of ECC coil is (a) 72 (b) 71 (c) 50 (d) 13.
- q) In MU operation wire no 25 is used for (a) Dynamic brake (b) EP governor (c) sanding (d) spare.
- r) Type of Excitation used in WDS-6 locomotive is (a) e-type (b) Static type (c) 3 field type (d) split pole type.
- s) Power Ground can not be removed by Driver (through MCO) if earth fault occurred in TMno./nos. (a) 1 (b) 2 (c) 1 & 2 (d) 1, 2 & 3.
- t) No. of traction motor of WDP₄ locomotive is (a) 2 b) 4 c) 6 d) 5).

C) State the following statements “True” or “False” . 1x10 = 10

- a) DC/DC loco is cranked by Auxiliary and Exciter generator.
- b) ECS is located in control stand of the diesel locomotive.
- c) TDR is energized after pick up of CK3 contactor.
- d) TGLR is present in WW governor equipped loco circuit.
- e) Trip current rating of MB₂ circuit breaker is 150 amps.
- f) PCS2 picks up at 4.0/2.8 kg/cm².
- g) In D.C. series motor, If load is increased, speed will also increased.
- h) In D.C. shunt motor, If load is decreased, speed will also increased.
- i) In D.C. series Generator, load voltage is always constant.
- j) Speed of D.C. motor can be controlled by changing armature resistance.

Group – “B”

Attempt any Five (5) Questions (All questions carry equal marks). 10 X 5 =50

1. What do you mean by transition for Diesel loco? Why does it necessary? How is it achieved in WDG3A locomotive – explain with proper diagram. 2+2+6=10
2. Enumerate overhauling procedure of traction motor used in Diesel locomotive. 10
3. What are the sensors, fitted in MEP-660 control system, describe about these sensors. 2+8=10
4. Enumerate the construction and working procedure of Micro Controller Based Governor 4+6=10
5. Describe the Electrical power transmission system of EMD (WDG4) locomotive with the help of necessary diagram. 10
6. Write short note on any two(2). 5 X 2=10
 - a) IGBT (b) TCC (c) Pre-lubrication (MEP-660)

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Instructor (C&W)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Group-A (Objective Questions)

Answer all questions

Q1. Fill in the blanks

1X30=30

- a) The quantity of oil in each side bearer of an ICF trolley is _____
- b) The amount of grease in an axle box of spherical roller bearing is _____
- c) The working strength of CBC used on coaches is _____
- d) The lateral clearance between side frame and axle box adopter casnub 22 W is _____
- e) The brake cylinder vent plug is used for _____.
- f) The size of brake cylinder in bogie mounted system is _____
- g) The water tank capacity of ICF coach is _____ litre
- h) The condemning limit of BLC wagon wheel diameter is _____
- i) The side bearer used in BLC wagon is _____
- j) The BSS hangers of an ICF bogie are fitted at an angle of _____ with vertical.
- k) The water tank capacity of ICF coach is _____ litre
- l) The minimum air pressure required for WRA is _____ kg/cm²
- m) Prescribed leakage rate while conducting leakage test on a coach is _____
- n) The working strength of CBC used on coaches is _____
- o) The Destruction tube is provided inside the _____
- p) The brake cylinder vent plug is used for _____.
- q) The codal life of RCF coach is _____
- r) Number of sliding valve provided in CDTS is _____
- s) In air brake system the thread joints are tightened with _____
- t) FRP stands for _____
- u) Electrometric pads are provided to reduce _____
- v) DV sensitivity test is done with a reduction of BP pressure by 0.6 kg/cm² in _____ secs.
- w) The lateral clearance between side frame and axle box adopter casnub 22 W is _____ .
- x) The train pipe dia of goods stock is _____ mm.
- y) The condemning limit of BLC wagon wheel diameter is _____ .
- z) The number of roller provided in each row CTRB is _____ .
- aa) The root radius of worn wheel profile used on CASNUB bogie is _____ .
- bb) The side bearer used in BLC wagon is _____ .
- cc) The standard gap between wheel and brake block in BOX wagon is _____ .
- dd) Diameter of knuckle pivot pin is _____

Q 2. Match the following

2x5=10

- | | |
|-----------------|----------------|
| a) ICF BOGIE | i) POP MARK |
| b) HYBRID Coach | ii) AC coaches |
| c) RMPU | iii) DASH POT |
| d) CBC | iv) 160 Km. |
| e) CASNUB BOGIE | v) Air Spring |

3. State True or False

1x10 = 10

- a) The hot box temperature is 90 degree centigrade.
- b) The number of roller provided in each row CTRB is 48
- c) The root radius of worn wheel profile used on CASNUB bogie is 13 mm
- d) Brake cylinder charging time in coaching stock during full service application is 3 to 5 sec
- e) The standard gap between wheel and brake block in BOX wagon is 6.25 mm
- f) The BSS hangers of ICF bogie are fitted at an angle with the vertical is 10degree.
- g) The number of roller provided in each row CTRB is 24
- h) The root radius of worn wheel profile used on CASNUB bogie is 13 mm
- i) Brake cylinder charging time in coaching stock during full service application is 3 to 5 sec
- j) The standard gap between wheel and brake block in BOX wagon is 6.25 mm

Group-B

Answer any Five of the following

5 X 10= 50

- Q1. (a) Why BOXNHL wagons are introduced in Indian Railway ? 3+6+1
(b) What are the special features BOXNHL of wagon ?
(c) What do you mean by slackless couplers ?
- Q.2 (a) What is corrosion? 2+3+5
(b) What are the vulnerable points of corrosion in COACH & Wagon?
(c) What is SWTR ? Explain the different testing under SWTR ?
- Q.3. (a) What are the salient features of BOXN-HA wagon ? 2+5+3
(b) Explain about its superstructure?
(c) What precaution do you take during welding IRSM-41
- Q.4 a) What are the salient features of Air Suspension system ? 4+4+2
(b) Draw a schematic diagram of air suspension system and label its parts.
(c) Compare the helical spring with the air spring
- Q5. (a) List out a comparative feature/technical data of ICF and LHB coaches. 6+2+2
(b) How heat and sound is managed in LHB Coaches?-roll mechanism fitted in LHB coaches?
(c) Write down the symptoms and causes of hot axle?
- Q6. (a) What do you mean by ODC? Classify the different classes of ODC with their salient features.
(b) What is the examination pattern of CC rake? 5+5
- Q7. Write short notes on the following (any four)
- (a) CDTS (b) PEASD (c) Special repair (d) WILD (e) BMBS 4 x 2 $\frac{1}{2}$ = 10

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Instructor (Electronics)** / STC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Date of Examination:

Duration: 3 Hours

Maximum Marks: 100

Part-A

Write any seven questions from Part-A. All questions carry equal marks.

Q1. Fill in the blanks with appropriate comments:

- a) If a body is negatively charged by rubbing , its weight is -----
- b) At absolute zero temperature the conductivity of semiconductor is-----
- c) To prepare P-type semiconductor ----- is used as dopant.
- d) The capacitance of a capacitor ----- depend on the charges on the plates .
- e) In N-type semiconductor ----- is the minor carrier.
- f) Energy loss of ground wave while propagating in the channel is called -----
- g) Expanded form of PWM is -----
- h) Zenner diode works on ----- biasing.
- i) For forward biasing of P-N junction the maximum voltage applied is -----
- j) Earth is being continuously charged through -----
- k) ----- and ----- are the building block of Logic gate.

Q2. State the following whether "TRUE" or "FALSE".

- i) For bidden gap for Ge is 0.72 eV.
- ii) During electrical power supply , Earth behaves as a huge capacitor.
- iii) Phosphorus is used as dopant for preparing P-type Semiconductor.
- iv) Potentiometer can be assumed as ideal voltmeter..
- v) Colour code system is not generally adopted for calculation of the resistance of carbon resistor.
- vi) Voltage gain is the ratio of change of output voltage to input voltage.
- vii) For conductor energy band overlap with valance band.
- viii) Capacitor is used to separate carrier wave from modulating signal .
- ix) Frequency for full wave rectifier is equal to the frequency of applied analogue signal.
- x) Digital signal is converted into analogue signal by Modem .

Q3 . What do mean by transistor? Describe with net sketch the input characteristic graph for n-p-n transistor.

Q4. What do you mean by biasing? Describe with net sketch the working principle of LED.

Q5. What do you mean by current gain? How will you show that the current gain in common base n-p-n transistor is less than that of common emitter n-p-n transistor?

Q6. What do you mean by reverse biasing? Describe with net sketch the working principle of Zenner diode.

Q7. What do you mean by communication? Describe sky wave communication.

Q8. What do you mean by modulation of electromagnetic wave? How is frequency of an wave is modulated and why is modulated?

Part-B

Write any three questions from Part-B. All questions carry equal marks.

Q10. Write the expanded form of the followings:

i) PWM ii) PVC iii) LED iv) VLSI v) TFT vi) FTP vii) HTML viii) RAM ix) CD x) LCD

Q11. Read the following Sentences carefully and indicate True or False :

- a) Standard Form No.11 is used for issuance of Minor Penalties.
- b) There is a provision of Child Care leave for an woman employee for a total period 730 days in her entire period of service.
- c) New Pension scheme has been introduced w.e.f. 01.01.2004.
- d) "Suspension" is a penalty under DAR.
- e) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit.
- f) Demand-16 deals with acquisition of Assets
- g) Frequency of verification for "A" category item under ABC analysis is 1 year
- h) Plan Head-41 deals with M&P items
- i) NSR No bears 10 digit numbers.
- j) Mega Bytes indicates the capacity of storage device.

Q11. A train moving at its 2/3rd speed from KGP reaches to PUI with 5 hours late from the schedule time. How many hours would the train take if it would have moved with its full speed?

Q.13 State the following whether "TRUE" or "FALSE"

- a) Devnagari is the script of Hindi
- b) Regional Language is used first in writing the name of a station
- c) Hindi language should be used in reply for a letter issued or signed in Hindi
- d) Hindi day is observed on 14 September as an Official language
- e) There are 9 sections in O.L Act
- f) Section 3:3 of O.L. Act is related with Bilingual (Hindi & English) use
- g) Andaman, Nicobar, Island is in "A" region
- h) There are 3 O.L. regions in India
- i) If an employee put up his replay in Hindi for an explanation called or for a charge sheet, his employer can not ask for English translation
- j) Shri A.V. Vajpayee is the first Representative, who addressed UNO in Hindi.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Lecturer** / STC under PSTC-against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Date of Examination:

Duration: 3 Hours

Maximum Marks: 100

Part-A

Write any seven questions from Part-A. All questions carry equal marks

Q1. Fill in the blanks with appropriate comments:

- a) Moment of inertia of a hollow sphere having mass "M" and radius "R" about an axis passing through its centre is --
- b) Dimensional unit of surface tension is -----
- c) A member of a machine which transmits power without any deformation is called -----
- d) For any thermodynamic process, entropy of the Universe -----
- e) The name of the main slug formed in a blast furnace is ----
- f) Lamis theorem is applicable when a body is in ----- under the action three forces
- g) ----- Cycle has the maximum efficiency among all thermodynamic cycles under the same temperatures limit.
- h) While machining mild steel, the nature of chips produced is -----
- i) White flame has ----- temperature than that of red flame.
- j) ----- is the second hardest material.

Q2. State the following whether "TRUE" or "FALSE".

- i) A system is in stable equilibrium when its potential energy is minimum.
- ii) The moment of a force about an axis is a vector quantity.
- iii) A spring is cut into three equal pieces and found spring constant of each spring $1/3^{\text{rd}}$ times that of original spring.
- iv) Rolling friction develops due to mechanical interlocking between two contact surfaces.
- v) When a train moves at 100 kmph, air resistance is directly proportional to the square of the relative velocity between air and the train.
- vi) Otto cycle comprises two isobaric processes and two isothermal processes.
- vii) When a body is lifted to a height "H", its potential energy is stored in the body.
- viii) In SHM, frequency of maximum K.E. is twice that of the frequency of the cycle.
- ix) When length of the simple pendulum tends to infinity, its time period also tends to infinity.
- x) All thermodynamic processes are treated as quasi static in nature.

Q3 .How will you comply with the following.-

- a) A mild steel shaft is to be made into power transmitting shaft.
- b) Density of steel ingot is to be increased.
- c) Seamless copper pipe has been hardened and it is to be put into service.
- d) Metal surface is to be made very smooth reflective surface.
- e) 1000 Kgf load is to be lifted by an effort of 10 Kgf.

Q4. Write short notes on the followings:

- a) MIG welding
- b) Piercing.
- c) Polymer .
- d) Babbit metal
- e) Metacentre

Q5. Explain different processes involved in Carnot Cycle and utility of this cycle. Also explain Why it is a theoretical cycle.

Q6. Explain the objectives of lubrication. Describe any two types of lubrication system..

Q7. Describe the following heat treat processes:

- a) Annealing.
- b) Normalising.
- c) Hardening.
- d) Tempering
- e) Nitriding

Q8. What do you mean by viscosity? How does viscosity play a significant role in lubrication. In the light of viscosity, describe terminal velocity of a body moving in a viscous fluid.

Q9 Normal reaction acting on the wheels of a coach is 1000Kgf when it is at rest. This reaction force shifts forward and makes an angle of 60° with the horizontal when the coach is in forward motion. Calculate the rolling friction experienced by the coach.

Part-B

Write any three questions from Part-B. All questions carry equal marks.

Q10. Write the expanded form of the followings:

- i) CAD ii) PMMA iii) ppm iv) RDSO v) RITES vi) LDCE vii) EDM viii) RAM
- ix)CD x) LCD

Q11. Read the following Sentences carefully and indicate True or False :

- a) Standard Form No.11 is used for issuance of Minor Penalties.
- b) There is a provision of Child Care leave for a woman employee for a total period 730 days in her entire period of service.
- c) New Pension scheme has been introduced w.e.f. 01.01.2004.
- d) "Suspension" is a penalty under DAR.
- e) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit.
- f) Demand-16 deals with acquisition of Assets
- g) Frequency of verification for "A" category item under ABC analysis is 1 year
- h) Plan Head-41 deals with M&P items
- i) NSR No bears 10 digit numbers.
- j) Mega Bytes indicates the capacity of storage device.

Q12. A train moving at its $\frac{2}{3}$ rd speed from KGP reaches to PUI with 5 hours late from the schedule time. How many hours would the train take if it would have moved with its full speed ?

Q.13 State the following whether "TRUE" or "FALSE"

- a) Devnagari is the script of Hindi
- b) Regional Language is used first in writing the name of a station
- c) Hindi language should be used in reply for a letter issued or signed in Hindi
- d) Hindi day is observed on 14 September as an Official language
- e) There are 9 sections in O.L Act
- f) Section 3:3 of O.L. Act is related with Bilingual (Hindi & English) use
- g) Andaman, Nicobar, Island is in "A" region
- h) There are 3 O.L. regions in India
- i) If an employee put up his replay in Hindi for an explanation called or for a charge sheet, his employer can not ask for English translation
- j) Shri A.V. Vajpayee is the first Representative, who addressed UNO in Hindi.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Instructor (EMU) / STC** under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Date of Examination:

Duration: 3 Hours

Maximum Marks: 100

Part-A

Write any seven questions from Part-A. All questions carry equal marks

- Q1. Fill in the blanks with appropriate comments:
- If a body is charged by rubbing it, its weight -----
 - A point charge is brought in an electric field. The electric field at a nearby point may increase if the charge is ---
 - The flux of the electric field through a closed surface due to all the charges is -----to the flux due to the charges enclosed by the surface
 - The capacitance of a capacitor ----- depend on the charges on the plates .
 - When no current is passed through a conductor, the average velocity of a free electron over a large period
 - is ---- ----
 - An electric circuit comprising semiconductors is called -----
 - A volt meter contains a huge resistance in -----
 - Zenner diode is used to supply -----
 - As the temperature increases, the resistance of semiconductor -----
 - Earth is being continuously charged through -----
- Q2. State the following whether "TRUE" or "FALSE".
- EMF of an electrolytic cell may be greater or less than the potential difference across the plates.
 - During electrical power supply , Earth behaves as a huge capacitor.
 - At Curie point, paramagnetic material becomes ferromagnetic material.
 - Potentiometer can be assumed as ideal voltmeter..
 - Colour code system is not generally adopted for calculation of the resistance of carbon resistor.
 - Anode plate of an electrolytic cell is positive.
 - For charging of an electrolytic cell, +ve plate of the cell is connected with the -ve terminal of the supply.
 - Magnetic lines of force is always a continuous curve.
 - Luminous efficiency of an incandescent bulb is generally more than 100%.
 - Earth fault may cause low voltage of the supply line.
- Q3 . Explain the salient features of EMU bogie assembly..
- Q4. Explain the trouble shooting procedure for the following faults.
- DJ not closing.
 - No traction in motor coach.
 - Head light not glowing
- Q5. Write short note on the following.
- Dash pot assembly
 - Pantograph.
 - Emergency brake application.
 - Rectifier fan

Q6. Explain the working principle of EMU showing the major equipments with a block diagram.

Q7. Explain the overhauling procedure of EMU traction motor. Why is DC series motor used as traction motor?

Q8. An inductor of inductance 100mH is connected with a resistance, a variable capacitance and an AC source of frequency 2.0kHz. What should be the value of the capacitance so that maximum current may be drawn into the circuit.

Q9. Explain the working of safety relays provided in EMU.

Part-B

Write any three questions from Part-B. All questions carry equal marks.

Q10. Write the expanded form of the followings:

- i) PWM ii) PVC iii) PNM iv) RDSO v) RITES vi) LDCE vii) JCM viii) RAM ix) CD
- x) LCD

Q11. Read the following Sentences carefully and indicate True or False :

- a) Standard Form No.11 is used for issuance of Minor Penalties.
- b) There is a provision of Child Care leave for a woman employee for a total period 730 days in her entire period of service.
- c) New Pension scheme has been introduced w.e.f. 01.01.2004.
- d) "Suspension" is a penalty under DAR.
- e) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit.
- f) Demand-16 deals with acquisition of Assets
- g) Frequency of verification for "A" category item under ABC analysis is 1 year
- h) Plan Head-41 deals with M&P items
- i) NSR No bears 10 digit numbers.
- j) Mega Bytes indicates the capacity of storage device.

Q11. A train moving at its 2/3rd speed from KGP reaches to PUI with 5 hours late from the schedule time. How many hours would the train take if it would have moved with its full speed?

Q.13 State the following whether "TRUE" or "FALSE"

- a) Devnagari is the script of Hindi
- b) Regional Language is used first in writing the name of a station
- c) Hindi language should be used in reply for a letter issued or signed in Hindi
- d) Hindi day is observed on 14 September as an Official language
- e) There are 9 sections in O.L Act
- f) Section 3:3 of O.L. Act is related with Bilingual (Hindi & English) use
- g) Andaman, Nicobar, Island is in "A" region
- h) There are 3 O.L. regions in India
- i) If an employee put up his replay in Hindi for an explanation called or for a charge sheet, his employer can not ask for English translation
- j) Shri A.V. Vajpayee is the first Representative, who addressed UNO in Hindi.

2013

Model Question Paper

for selection of

Instructor for

RWTI and Centralised C&W

Training School/KGP

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Training Officer (SSE/Welding)**/ RWTI and Centralized C&W Trg School under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Date of Examination:

Duration: 3 Hours

Maximum Marks: 100

Part-A

- Q1. Fill in the blanks with appropriate comments: 1 x 25 = 25
- a) NSR No. Bears-----digit number.-
 - b) Consignee code bears ----- digit numbers
 - c) PL No. bears -----digit number.
 - d) Budget estimate is prepared in the month of -----
 - e) Power of CME to sanction M&P item up to Rs.-----
 - f) There is a provision of Child Care leave for an woman employee for a total period of 730 days in her entire period of service.
 - g) Standard Form No. ----- is used for issuance of Minor Penalties.
 - h) Expanded form of MACP is -----
 - i) There are ----- sections in O.L Act
 - j) Section ----- of O.L. Act is related with Bilingual (Hindi & English) use
 - k) The process of joining two pieces of metal by application of heat is called-----welding
 - l) The capacity of metal to be welded under fabrication conditions satisfactorily is called-----
 - m) Welding process, where two pieces of metal of same cross section are gripped together and
 - n) Voltage drop across the arc is ----- when the electrode is shorted to the work piece.
 - o) Soft solder is composed of ----- and -----
 - p) Quality of welding is tested by----- machine.
 - q) Expanded form of BHN is -----
 - r) Welding joint is ----- type of joint .
 - s) A metal is said to be cold worked if it is mechanically processed below -----
 - t) pressed while heat is generated in the contact surface is called-----
 - u) Pressure tubes are generally joined by ----- welding
 - v) During gas cutting process, metal is cut due to -----of O₂
 - w) Full form of DVD is -----
 - x) MS-Word is an word processing -----
 - y) 101010 in binary number system is equivalent to ----- in decimal number system
- Q2. State the following whether "TRUE" or "FALSE". 1 x 25 = 25
- a) Frequency of verification for "A" category item under ABC analysis is 1 year.
 - b) The degree of control should be rigorous for "A" items & should be minimum for "C" item items.
 - c) SI No. 2g (Works matter) of USOP deals with the sanction of Estimate for Sanctioned work.
 - d) CPDE is to publish notification of Open Tender in Railway.
 - e) At Railway Board level, PNM is held once in four months.
 - f) The staff excluded is eligible for night duty allowance.
 - g) All name plates, sign boards, letter heads, inscriptions on envelopes and other stationery etc., shall be in bilingual.
 - h) Expanded form of HOER is Hour of Employment Rules.
 - i) New pension scheme has been started from 01-01-2006.
 - j) As per O.L. regions in India, West Bengal is in "B" region.

- k) Devnagari is the script of Hindi
- l) Hard disk is an example of primary memory unit.
- m) MS-Office is operating system software.
- n) Otto cycle comprises two isobaric processes and two isothermal processes.
- o) When length of the simple pendulum tends to infinity, its time period also tends to infinity.
- p) A spring is cut into three equal pieces and found spring constant of each spring $1/3^{\text{rd}}$ times that of original spring constant.

- q) The moment of a force about an axis is vector .
- r) Popping usually occurs due to pre-ignition of gasses.
- s) For DCSP , the work-piece is connected to the negative terminal of the welding machine..
- t) ----- welding is generally adopted in the repair of broken heavy parts..
- u) For cutting purpose ,LPG is less advantageous over acetylene gas.
- v) Arc voltage increases with increase in arc length.
- w) Deposition of filler metal increases with increase in current.
- x) Penetration is least for DCRP arc welding.
- y) Joining of two pieces of metal sheet by fusible alloy is called soldering

Part-B

Answer any five questions from the following:

10 x 5 = 50

Q3 .How will you comply the following:-

- a) 7.5Cm thick pressure vessel to be welded.
- b) Broken rails are to be welded .
- c) Seamless pressure tubes are to be welded.
- d) BOXN end wall having base metal IRS M-41, IS 2062is to be welded
- e) Cast iron bogie frame has been cracked and it is to be welded..

Q4. Write short notes on the followings:

- a) Slag inclusions.
- b) Cold cracking.
- c) Soldering
- d) GTAW.
- e) Cold welding

Q5. Compare the gas-metal arc welding and gas-tungsten arc welding..

Q6. What are the advantages of low temperature joining methods over fusion welding ?.

Q7. What are the advantages of AC arc welding ? Why is it difficult to start AC arc ? How is it simplified in practice ?

Q8. You are going to be an In charge of an Welding Institute. List the welding machineries with detailed specifications along with accessories that must be available in your Institute for imparting training to 20 nos of trainees in every month so as to meet the welding needs of Mechanical department of erst-while S.E.Railway.

Q9. List the various welding defects and suggest the remedial steps to be taken against each type of defect.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **C&W Instructor** / RWTI and Centralized C&W Trg School under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Group-A (Objective Questions)

Answer all questions

Q1. Fill in the blanks 1X30=30

- a) The quantity of oil in each side bearer of an ICF trolley is_____
- b) The amount of grease in an axle box of spherical roller bearing is _____
- c) The working strength of CBC used on coaches is _____
- d) The lateral clearance between side frame and axle box adopter casnub 22 W is_____
- e) The brake cylinder vent plug is used for _____.
- f) The size of brake cylinder in bogie mounted system is _____
- g) The water tank capacity of ICF coach is _____ litre
- h) The condemning limit of BLC wagon wheel diameter is _____
- i) The side bearer used in BLC wagon is _____
- j) The BSS hangers of an ICF bogie are fitted at an angle of _____ with vertical.
- k) The water tank capacity of ICF coach is _____ litre
- l) The minimum air pressure required for WRA is _____ kg/cm²
- m) Prescribed leakage rate while conducting leakage test on a coach is _____
- n) The working strength of CBC used on coaches is _____
- o) The Destruction tube is provided inside the _____
- p) The brake cylinder vent plug is used for _____.
- q) The codal life of RCF coach is _____
- r) Number of sliding valve provided in CDTS is _____
- s) In air brake system the thread joints are tightened with _____
- t) FRP stands for _____
- u) Electrometric pads are provided to reduce _____
- v) DV sensitivity test is done with a reduction of BP pressure by 0.6 kg/cm² in _____ secs.
- w) The lateral clearance between side frame and axle box adopter casnub 22 W is_____ .
- x) The train pipe dia of goods stock is _____ mm.
- y) The condemning limit of BLC wagon wheel diameter is_____ .
- z) The number of roller provided in each row CTRB is _____ .
- aa) The root radius of worn wheel profile used on CASNUB bogie is _____ .
- bb) The side bearer used in BLC wagon is _____ .
- cc) The standard gap between wheel and brake block in BOX wagon is _____ .
- dd) Diameter of knuckle pivot pin is _____

Q 2. Match the following

2x5=10

- | | |
|-----------------|----------------|
| a) ICF BOGIE | i) POP MARK |
| b) HYBRID Coach | ii) AC coaches |
| c) RMPU | iii) DASH POT |
| d) CBC | iv) 160 Km. |
| e) CASNUB BOGIE | v) Air Spring |

Q 3. State True or False

1x10 = 10

- a) The hot box temperature is 90 degree centigrade.
- b) The number of roller provided in each row CTRB is 48
- c) The root radius of worn wheel profile used on CASNUB bogie is 13 mm

- d) Brake cylinder charging time in coaching stock during full service application is 3 to 5 sec
- e) The standard gap between wheel and brake block in BOX wagon is 6.25 mm
- f) The BSS hangers of ICF bogie are fitted at an angle with the vertical is 10degree.
- g) The number of roller provided in each row CTRB is 24
- h) The root radius of worn wheel profile used on CASNUB bogie is 13 mm
- i) Brake cylinder charging time in coaching stock during full service application is 3 to 5 sec
- j) The standard gap between wheel and brake block in BOX wagon is 6.25 mm
- k)

Group-B Answer any Five of the following

5 X 10= 50

- Q1. (a) Why BOXNHL wagons are introduced in Indian Railway ? 3+6+1
(b) What are the special features BOXNHL of wagon ?
(c) What do you mean by slackless couplers ?
- Q.2 a) What is corrosion? 2+3+5
(b) What are the vulnerable points of corrosion in COACH & Wagon?
(c) What is SWTR ? Explain the different testing under SWTR ?
- Q.3. (a) What are the salient features of BOXN-HA wagon ? 2+5+3
(b) Explain about its superstructure?
(c) What precaution do you take during welding IRSM-41
- Q.4 a) What are the salient features of Air Suspension system ? 4+4+2
(b) Draw a schematic diagram of air suspension system and label its parts.
(c) Compare the helical spring with the air spring
- Q5. (a) List out a comparative feature/technical data of ICF and LHB coaches. 6+2+2
(b) How heat and sound is managed in LHB Coaches?-roll mechanism fitted in LHB coaches?
(c) Write down the symptoms and causes of hot axle?
- Q6. (a) What do you mean by ODC? Classify the different classes of ODC with their salient features.
(b) What is the examination pattern of CC rake? 5+5
- Q7. Write short notes on the following (any four)
- (a) CDTS (b) PEASD (c) Special repair (d) WILD (e) BMBS 4 x 2 $\frac{1}{2}$ = 10
-

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Weld. Instructor** / RWTI and Centralized C&W Trg School under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Date of Examination:

Duration: 3 Hours

Maximum Marks: 100

Part-A

Write any seven questions from Part-A. All questions carry equal marks

Q1. Fill in the blanks with appropriate comments:

- (i) The process of joining two pieces of metal by application of heat is called-----welding
- (ii) The capacity of metal to be welded under fabrication conditions satisfactorily is called-----
- (iii) Welding process, where two pieces of metal of same cross section are gripped together and pressed while heat is generated in the contact surface is called-----
- (iv) Voltage drop across the arc is ----- when the electrode is shorted to the work piece.
- (v) Soft solder is composed of ----- and -----
- (vi) Quality of welding is tested by----- machine.
- (vii) Expanded form of BHN is -----
- (viii) Welding joint is ----- type of joint .
- (ix) Pressure tubes are generally joined by ----- welding

Q2. State the following whether "TRUE" or "FALSE".

- i) B2 type electrode is used for MMAW where base metal is mild steel.
- ii) The moment of a force about an axis is vector .
- iii) Popping usually occurs due to pre-ignition of gasses.
- iv) For DCSP , the work-piece is connected to the negative terminal of the welding machine..
- v) ----- welding is generally adopted in the repair of broken heavy parts..
- vi) For cutting purpose ,LPG is less advantageous over acetylene gas.
- vii) Arc voltage increases with increase in arc length.
- viii) Deposition of filler metal increases with increase in current.
- ix) Penetration is least for DCRP arc welding.
- x) Joining of two pieces of metal sheet by fusible alloy is called soldering

Q3 .How will you comply the following.:-

- a) 7.5Cm thick pressure vessel to be welded.
- b) Broken rails are to be welded .
- c) Seamless pressure tubes are to be welded.
- d) BOXN end wall having base metal IRS M-41, IS 2062is to be welded
- e) Cast iron bogie frame has been cracked and it is to be welded..

Q4. Write short notes on the followings:

- a) Slag inclusions.
- b) Cold cracking.
- c) Soldering
- d) GTAW.
- e) Cold welding

Q5. Compare the gas-metal arc welding and gas-tungsten arc welding..

Q6. What are the advantages of low temperature joining methods over fusion welding ?.

Q7. What are the advantages of AC arc welding ? Why is it difficult to start AC arc ? How is it simplified in practice ?

Q8. You are going to be an In charge of an Welding Institute. List the welding machineries with detailed specifications along with accessories that must be available in your Institute for imparting training to 20 nos of trainees in every month so as to meet the welding needs of Mechanical department of erst-while S.E.Railway.

Q9. List the various welding defects and suggest the remedial steps to be taken against each type of defect.

Part-B

Write any three questions from Part-B. All questions carry equal marks.

Q10. Write the expanded form of the followings:

- i) MMAW ii) LPG iii) C_2H_2 iv) RDSO v) RITES vi) LDCE vii) CIG viii) DCRP
ix) RAM x) CD

Q11. Read the following Sentences carefully and indicate True or False :

- a) Standard Form No.11 is used for issuance of Minor Penalties.
b) There is a provision of Child Care leave for an woman employee for a total period 730 days in her entire period of service.
c) New Pension scheme has been introduced w.e.f. 01.01.2004.
d) "Suspension" is a penalty under DAR.
e) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit.
f) Demand-16 deals with acquisition of Assets
g) Frequency of verification for "A" category item under ABC analysis is 1 year
h) Plan Head-41 deals with M&P items
i) NSR No bears 10 digit numbers.
j) Mega Bytes indicates the capacity of storage device

Q12. One run arc welding is to be done along the edges of the following plates of equal areas.

- a) Triangular plate
b) Rectangular plate
c) Square plate
d) Circular plate.

Write the above plates according to their descending order of welding cost.

Q.13 State the following whether "TRUE" or "FALSE"

- a) Devnagari is the script of Hindi
b) Regional Language is used first in writing the name of a station
c) Hindi language should be used in reply for a letter issued or signed in Hindi
d) Hindi day is observed on 14 September as an Official language
e) There are 9 sections in O.L Act
f) Section 3:3 of O.L. Act is related with Bilingual (Hindi & English) use
g) Andaman, Nicobar, Island is in "A" region
h) There are 3 O.L. regions in India
i) If an employee put up his replay in Hindi for an explanation called or for a charge sheet, his employer can not ask for English translation
j) Shri A.V. Vajpayee is the first Representative, who addressed UNO in Hindi.

2013

Model Question Paper

for selection of

Instructor for

BTC/KGPW

Sub: Model Question Paper for examination against filling up of ex-cadre post of
Chief Instructor for BTC/KGPW under PSTC/KGP against WPO/KGPW's letter
No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Date of Examination:

Duration: 3 Hours

Maximum Marks: 100

Part-A

Write any seven questions from Part-A. All questions carry equal marks

Q1. Fill in the blanks with appropriate comments:

- (i) Adjustable Spanners generally conforms-----specification
- (ii) Universal chuck comprises-----no of jaws.
- (iii) Purpose of Work study is to achieve.....
- (iv) Communication may be defined as _____ between human beings.
- (v) Unsafe action & unsafe condition in an workshop results.....
- (vi) Consignee code bears ----- digit numbers.
- (vii) DCSP in welding technology stands for -----
- (viii) During gas cutting process, metal is cut due to -----of O₂.
- (ix) A metal is said to be cold worked if it is mechanically processed below -----
- (x) It is said to be electrical discharge if electric current passes through -----

Q2. State the following whether "TRUE" or "FALSE".

- i) In any Railway zone , AGM is vested with full power in respect revenue expenditure.
- ii) CME has no power to sanction M&P proposal.
- iii) Month April of every year is the initiation of Budget cycle.
- iv) Buna-S and Buna-N are all synthetic rubber items.
- v) SF-5 is served in respect of minor penalty.
- vi) NSR No. bears 10 digit numbers.
- vii) Account's vetting focuses on reservation of fund.
- viii) Equipment costing less than Rs 1(one) lakh comes under tools and plants.
- ix) Atomization of fuel is required to increase surface area of fuel for Oxygen to react.
- x) For cooling Diesel Locomotive, water is supplied to the components in upward direction.

Q3 .How will you comply the following.:-

- a) A mild steel shaft is to be made into power transmitting shaft.
- b) Density of steel ingot is to be increased .
- c) Seamless copper pipe has been hardened and it is to be put into service.
- d) Metal surface is to be made very smooth reflective surface.
- e) 1000 Kgf load is to be lifted by an effort of 10 Kgf.

Q4. Write short notes on the followings:

- a) Zyglo Test
- b) Allocation.
- c) Polymer .
- d) Case hardening.
- e) Reappropriation of Fund

Q5. What do you mean by viscosity ? How does viscosity play a significant role in lubrication?
In the light of viscosity, describe terminal velocity of a body moving in a viscous fluid.

Q6. What do you mean by accident in Railway? Write the duty of a Mechanical Supervisors attending a ailway accident spot.

Q7. Write various steps to be followed for procurement of an M&P item .

Q8. What do mean by Railway Budget ? Describe the Budget cycle in brief. are the actions to be taken during the following situations?

Q9. Normal reaction acting on the wheels of a coach is 1000Kgf when it is at rest. This reaction force shifts forward and makes an angle of 60^0 with the horizontal when the coach is in forward motion. Calculate the rolling friction experienced by the coach.

Part-B

Write any three questions from Part-B. All questions carry equal marks.

Q10. Write the expanded form of the followings:

i) CAD ii) PMMA iii) ppm iv) EPROM v) RITES vi) FTP vii) EDM viii) RAM ix) HTML x) LCD

Q11. Read the following Sentences carefully and indicate True or False :

- Standard Form No.11 is used for issuance of Minor Penalties.
- There is a provision of Child Care leave for an woman employee for a total period 730 days in her entire period of service.
- New Pension scheme has been introduced w.e.f. 01.01.2004.
- “Suspension” is a penalty under DAR.
- HOER applies to all Rly non-gazetted employees excluding employees working Prod unit.
- Demand-16 deals with acquisition of Assets
- Frequency of verification for “A” category item under ABC analysis is 1 year
- Plan Head-41 deals with M&P items
- NSR No bears 10 digit numbers.
- Mega Bytes indicates the capacity of storage device.

Q12. A locomotive consumes 6.5 liters of HSD (having Sp. Gravity of 0.9) per km when working a load. The full tank of the Locomotive is loaded with 45000 Kg of HSD and starts from KGP for VSKP.. Find whether the Driver can take the train from KGP to VSKP if the distance from KGP to VSKP is 720 Km and fuel pump draws air when the fuel level falls below 300 liters.

Q.13 State the following whether “TRUE” or “FALSE”

- Devnagari is the script of Hindi
- Regional Language is used first in writing the name of a station
- Hindi language should be used in reply for a letter issued or signed in Hindi
- Hindi day is observed on 14 September as an Official language
- There are 9 sections in O.L Act
- Section 3:3 of O.L. Act is related with Bilingual (Hindi & English) use
- Andaman, Nicobar, Island is in "A" region
- There are 3 O.L. regions in India
- If an employee put up his replay in Hindi for an explanation called or for a charge sheet, his employer can not ask for English translation
- Shri A.V. Vajpayee is the first Representative, who addressed UNO in Hindi

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Sr. Instructor (Carriage)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

PART-I

Q1. Choose the correct answer

1x15 =15

- I) The choke diameter of guard's emergency brake valve is
a) 4mm b) 5mm c) 6mm d) 8mm
- II) The standard buffer projection from Head stock is
a) 650mm b) 635mm c) 620mm d) 660mm
- III) Minimum permissible buffer projection from Head stock is
a) 635mm b) 605mm c) 590mm d) 584mm
- IV) Numbers of antiroll bars fitted in one FIAT bogie is
a) 02 b) 01 c) 03 d) 04
- V) Link & pin is a type of
a) Rod b) Hinge c) Joint d) Coupler
- VI) The length of modified brake block hanger is
a) 235mm b) 205mm c) 225mm d) 230mm
- VII) IOH schedule of LHB coaches is
a) 9 Months b) 18 Months c) 36 Months d) 12 Months
- VIII) The colour code of "A" group coil spring is
a) yellow b) green c) oxford blue d) white
- IX) The capacity of hydraulic shock absorber in ICF coach is
a) 600 kg b) 500 kg c) 400 kg d) 45 kg
- X) In twin pipe system the AR pressure should be
a) 5 kg/cm square b) 6 kg/cm square c) 7 kg/cm square d) 8 kg/cm square
- XI) Cut off angle cock can be fitted to
a) FP b) BP c) BP & FP d) None
- XII) In a conventional air brake system the number of brake cylinder is
a) 3 b) 4 c) 2 d) 1
- XIII) . The function of dirt collector is to
a) Segregate dirt particle from air b) Charge DV c) Polish DV d) None
- XIV) In BMBC coach ,hole adjustment of curved pull rod to be done when wheel diameter reduces to
a) 839mm b) 842 mm c) 846mm d) none
- XV) The choke diameter of PEAV in LHB coach is
a) 19mm b) 10mm c) 15mm d) 22mm

Q2. Match the following

1x10 =10

- | | |
|-------------------|------------------|
| a) Retention Tank | i) BMBC |
| b) Pawl | ii) WSP |
| c) In-Shot Valve | iii) CDTS |
| d) Speed Sensor | iv) PEASD |
| e) Pilot Valve | v) DV |
| f) FIAT BOGIE | vi) AC Chair Car |
| g) HYBRID Coach | vii) AC coaches |
| h) RMPU | viii) LHB Coach |
| i) CBC | ix) 160 Km. |
| j) Mechanism | x) Air Spring |

Q3. Expand the following .

1x5=5

- a. COFMOW b . RITES c . IRIMEE d . CRSE e.. RDSO

Q4. Fill in the blanks:

1x20=20

- a) The maximum temperature for the hot axle is _____
- b) Weakest link of CBC is _____
- c) _____ types of water tanks are provided in LHB coaches.
- d) No. of BC in LHB is _____
- e) In ICF coach weight of the body is transferred through _____
- f) Maximum limit of flat place in ICF coach _____
- g) The radius at the root of the flange of new worn wheel profile is _____
- h) Destruction tube is provided inside the _____
- i) In Air Brake System the thread joints are tightened with _____
- j) No. of Isolating cock in a Air brake system is _____
- k) Dia of Brake Cylinder of LHB coach is _____
- l) Dia of branch pipe of PEAV is _____
- m) During full service application brake pipe pressure is reduced by _____
- n) No. of toilets provided in LHB coach are _____
- o) The length of LHB coach has been increased in comparison to ICF coach is approx-----
--.
- p) Piston stroke of BC of LHB coach s _____
- q) _____ types of water tanks are provided in LHB coaches.

- r) Wheel base in ICF coach is _____
- s) Wheel base in Fiat trolley is _____
- t) -----type couplers are used in LHB

PART-II

Answer any five questions

10 x 5 = 50

Q 5. Draw the air-brake system in a coach. Explain the function of the distributor valve.

Q 6. What are the advantage of Bogie mounted brake cylinder over under slung Brake cylinder? Describe briefly
the function of Bogie mounted brake cylinder.

Q7. What are the items upgraded for introduction of 18 months POH in coaches? Why these upgraded items have
been introduced?

Q 8. Why are 'L' type and 'K' type brake blocks not interchangeable? Give your answer in detail.

Q9. Name the different tests conducted in SCTR?

Q10. What are the precautions to be followed while maintaining the bogie mounted brake system?

Q11 . What is corrosion ? What are the vulnerable points of corrosion in ICF bogies and coaches?

What measure will you take to minimize corrosion ?

- Q 12. (a) What are the salient features of Air Suspension system ?
(b) Draw a schematic diagram of air suspension system and label its parts.
(c) Compare the helical spring with the air spring

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of
Sr. Instructor (Wagon) / BTC under PSTC-KGP against WPO/KGPW's letter
No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

PART-I

Q1.Fill in the blanks:

1 x 20 = 20

- I. New wheel dia of Box Wagon is _____
- II. Elastomeric pads are provided to _____
- III. The maximum temperature for the hot axle is _____
- IV. Weakest link of CBC is _____
- V. Dia of brake pipe in goods train is _____.
- VI. Tare weight of BCN wagon is _____ tons
- VII. "C" class ODC shall be moved during _____
- VIII. CC rake means _____
- IX. The standard gap between wheel & brake block in BOXN wagon is _____
- X. Composite brake block used in freight stock is _____
- XI. The radius at the root of the flange of new worn wheel profile is _____
- XII. _____ type couplers are used in
- XIII. New wheel dia of Box Wagon is _____
- XIV. Condemning wheel dia of Box Wagon is _____
- XV. Elastomeric pads are provided to _____ Wheel flange.
- XVI. The high capacity draft gear is _____
- XVII. Type of CBC used in Indian Railway is _____ type.
- XVIII. Working strength of CBC is _____
- XIX. Dia of knuckle pivot pin is _____
- XX. Weakest link of CBC is _____
- XXI. Destruction tube is provided inside the _____
- XXII. In Air Brake System the thread joints are tightened with _____
- XXIII. During full service application brake pipe pressure is reduced by _____
- XXIV. Dia of brake pipe in goods train is _____.
- XXV. FRP stands for _____
- XXVI. Tare weight of BCN wagon is _____ tons
- XXVII. "C" class ODC shall be moved during _____
- XXVIII. CC rake means
- XXIX. The standard gap between wheel & brake block in BOXN wagon is _____
- XXX. Composite brake block used in freight stock is _____

Q2. Match the following

2 x 5 = 10

- | | |
|-----------------|----------------------|
| a) Pawl | i) Casnub |
| b) Pop Marks | ii) L' type Bk.Block |
| c) Straight Bar | iii) BMBC |
| d) Goods | iv) WSP |
| e) Speed Sensor | v) BLC |

Q3. Choose the correct answer:

1 x 10 = 10

- I. The nominal longitudinal clearance between side frame & axle box adopter of 22W retro trolley is
a) 2mm b) 4mm c) 6mm d) NIL
- II. The nominal lateral clearance between side frame & axle box adopter of Casnub 22HS bogie is
a) 18mm b) 16mm c) 22mm d) 25mm
- III. The choke diameter of guard's emergency brake valve is
a) 4mm b) 5mm c) 6mm d) 8mm

- IV. POP marks are related to
 a) Tank Wagon b) ICF Bogie c)FIAT Bogie d) Casnub Trolley
- V. The coefficient of friction is greater in case of
 a) L type brake block b) K type brake block c) C.I. brake block
- VI. The wheel base of casnub trolley is
 a) 2020mm b) 2030mm c) 2000mm d) 2010mm
- VII. Condemning limit of Snubber spring is
 a)278mm b) 270mm c)280mm d)250mm
- VIII. BMBS is introduced in
 a) BOXNHL b) BOXN c) BCN d) BTPN
- IX. Casnub bogie has
 a)Primary suspension b) secondary suspension c) both
- X. Trammel gauge is used to measure
 a) Piston stroke b) bogie length c) Cylinder dia. d) Squireness of bogie

PART-II

Answer any five of the following

10 x 5 = 50

Q4. Why are 'L' type and 'K' type brake blocks not interchangeable? Give your answer in detail.

Q5. Name the different tests conducted in SWTR?

Q6. What are the precautions to be followed while maintaining the bogie mounted brake system?

Q7. what do you understand by trammel gauge? How would you check trolley with this gauge?

Q8. List out the names of the major activities which are taken during ROH of BOXN Wagon.

Q9 What is WILD ? Why is WILD needed?

Q10. (a) Why BLC wagons are introduced in Indian Railway?

(b) What are the special features of BLC wagon ?

(c)What do you mean by slackless couplers ?

Q11. (a) What are the differences between cast part and forged part ?

(b)State four points of differences between cast wheel and forged wheel ?

(c) What are bearing defects and its causes?

Q12. What do you mean by corrosion? How is it occurred ? What are the vulnerable points of corrosion in wagons? How can it be checked ?

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Sr. Instructor (Loco)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

- Q.1 (A) Fill in the blanks with appropriate comments 1x 25 =25
- a Files are made of -----
 - b Buffing is employed for -----
 - c Surface Plate is made of -----
 - d Tap is used for ----- operation
 - e Least count of Micrometer in Metric System is -----
 - f HSS stands for -----
 - g Morse taper shank is used in -----
 - h Filler gauge is used to measure -----.
 - i Tempering is a process of heat treatment which is carried out after -----
 - j Twist drills are made of -----
 - k The process of joining two pieces of metal by application of heat is called-----welding
 - l Expanded form of BHN is -----
 - m The least count of Micrometer in inch system is-----
 - n Micrometer is a instrument of -----
 - o The angle of Dot punch is-----
 - p Full form of PCO is -----
 - q Tyre turning of Locomotive wheel is done by -----Lathe
 - r Full form of CNC machine is -----
 - s Mechanical advantage of crane is -----than 50%
 - t ICF wheel set is equipped with ----- roller bearing
 - u ----- based grease is used in all types of roller bearing
 - v NSR No. Bears-----digit number.
 - w Consignee code comprises----- digits
 - x Primary Unit-28 deals with expenditure against -----
 - y Expanded form of VCD is -----
- Q.1 (B) Write "True" or "False" 1x 25 =25
- a Devnagari is the script of Hindi
 - b Regional Language is used first in writing the name of a station.
 - c Andaman, Nicobar, Island is in "A" region.
 - d Mega Bytes indicates the capacity of storage device
 - e Expanded form of ALU is Arithmetic and Logic Unit
 - f Expanded form ASCII code is American Standard Code for Information and Interface.
 - g MS-Office is an Operating System soft ware
 - h Combination of bits is called Byte
 - i Hard disk is a primary storage device
 - j There is a provision of Child Care leave for an woman employee for a total period 730 days
 - k HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
 - l When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
 - m The staff excluded are eligible for night duty allowance
 - n New Pension scheme has been introduced w.e.f. 01.01.2006
 - o Standard Form No. 5 is used for issuance of Minor Penalties

p	Zygo test is done to know the internal flaws
q	To know Surface Crack UST is conducted
r	SWL stands for Special Working Load
s	Surface cracks are detected with the help of DPT
t	10^{-3} is the least count of micrometer in Standard/British System
u	Hacksaw blades are made of high carbon steel
v	Full form of HSS is High Speed steel
w	Full form of TIG tungsten inert gas welding.
x	Full form of HSD is High surface Density
y	Full form of ICF is Indian Coach factory

Part-II

Answer any Five from the following:

10x 5 = 50

Q.3 Write short note on the following:

- a) Tempering b) Normalising c) Annealing d) Case hardening e) Carburizing

Q.4 Discuss briefly on the following :

- i) 'Go` and 'No Go` Gauge ii) Surface Plate iii) Hermaphrodite Calipers
iv) Angle Plate v) Vernier Bevel protector

Q.5 What are the common type of hand tools used in fitting work? Discuss those tools briefly.

Q.6 What do mean by limit, fit, tolerance, clearance and deviation? Describe these terms With neat sketch.

Q.7 a) Why is tyre turning of Loco wheel required ?.
b) Describe the process of assembling wheel set.

Q.8 i) What is incentive ? Why is it required? How is incentive calculated in Kharagpur Workshop?

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Sr. Instructor (Diesel)** / BTC under PSTC-KGP against WPO/ KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

- Q.1 (A) Fill in the blanks with appropriate comments 1x 25 =25
- a No. main bearings are available in WDM₂ is -----
 - b Turbo supercharger in Diesel Locomotive is to increase -----
 - c Thermal efficiency of Diesel cycle is -----Petrol cycle
 - d "S"-Pipe is provided in Diesel Locomotive to lubricate-----
 - e As the temperature of engine increases, viscosity of Lube Oil-----.
 - f High exhaust temperature is the indication of
 - g Injection Pressure of fuel oil is made high for atomization of oil and ----- against compressed air
 - h Atomization of fuel is required to increase ----- Of fuel for Oxygen to react
 - i Inner surface of liner is made -----
 - j In turbo supercharger pressure of intake air is increased due to.....
 - k For cooling Diesel Locomotive components, water is supplied to the components indirection
 - l With in the compressor crank case block, both negative and positive pressures are generated. They are and
 - m Hardness of cam lobe must than that of cam roller
 - n Inner diameter of liner sleeve must bethan outer diameter of Liner
 - o Hardness of Split gear key must be than that of the crank shaft.
 - p Torque required for tightening Fuel "T" jumper bolt is -----
 - q POH of Locomotive is carried out after every -----Years
 - r Crank vacuum is measured by
 - s Baffle plates are provided inside the Fuel oil tank to reduce -----
 - t After cooler is used to cool -----.
 - u Intercooler is used to cool-----
 - v NSR No. Bears-----digit number.
 - w Consignee code comprises----- digits
 - x Primary Unit-28 deals with expenditure against -----
 - y Expanded form of VCD is -----

- Q.1 (B) Write "True" or "False" 1x 25 =25
- a Devnagari is the script of Hindi
 - b Regional Language is used first in writing the name of a station.
 - c Andaman, Nicobar, Island is in "A" region.
 - d Mega Bytes indicates the capacity of storage device
 - e Expanded form of ALU is Arithmetic and Logic Unit
 - f Expanded form ASCII code is American Standard Code for Information and Interface.
 - g MS-Office is an Operating System soft ware
 - h Combination of bits is called Byte
 - i Hard disk is a primary storage device
 - j There is a provision of Child Care leave for an woman employee for a total period 730 days
 - k HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
 - l When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed

m	The staff excluded are eligible for night duty allowance
n	New Pension scheme has been introduced w.e.f. 01.01.2006
o	Standard Form No. 5 is used for issuance of Minor Penalties
p	Objective of Supercharging is to feed pressurized air to the engine cylinder.
q	Air-Fuel ratio for Diesel engine is 5:1
r	Tractive effort is the maximum force that can be applied by the vehicle.
s	There are 09 nos of main bearings in WDM ₂
t	Dry-Run test ensures the proper movement of fuel oil linkage
u	Load Box test ensures hauling capacity of Locomotive
v	Blow-By test ensures the sealing of combustion chamber
w	TSC comprises five numbers of casings
x	SFC ensures the overall health of Diesel Locomotive
y	Effective Dynamic brake operation increases the frequency of wheel turning

Part-II

Answer any Five from the following:

10x 5 = 50

Q2. Write notes on

a) SFC, b) Non-Stock Item , c) CPU , d) Statistical failure

Q.3. What are the advantages of Air brake system over Vacuum brake system? Describe Independent brake system employed in Diesel Locomotive.

Q.4 What are the recent modifications being introduced in diesel locomotives from mechanical side?

Q.5 What is preventive maintenance? Describe in details the items to be taken care of during carrying out M2 Schedule on Diesel Locomotive.

Q.6. Describe the necessary precautions are to be taken to minimize the failure against Hot Engine trouble in Diesel Locomotive .

Q.7. Why is Load box test conducted and describe the procedure of Load box test.

Q.8. Describe with net sketch the Lube oil system incorporated in Diesel Locomotive.

Q.9 Write short notes on any Four (4):

- a) Blow-by test of Engine power assembly.
- b) Over speed device .
- c) Zyglo test.
- d) Dry-run test.
- e) Orifice test of fuel feed system.

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr Instructor-I (Fitter)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013.

Full Marks-100

Time-3 hours

Part-A

Write any seven questions from Part-A. All questions carry equal marks

Q1. Fill in the blanks with appropriate comment: 1 x 10 = 10

- a) Wheel and axle are the example of _____ Fit.
- b) Drill jig is to hold the job and guide _____.
- c) Least count of Micrometer in Metric System is _____.
- d) Three jaw chuck is also known as ----- chuck
- e) Least count of Vernier Caliper in Metric System is _____.
- f) Vernier Bevel Protector is used to measure the----- of a job.
- g) Taps are used to cut _____.
- h) Twist drills are made of _____.
- i) Hammers are made of _____.
- j) Files are generally made up of -----

Q2. Choose the correct option against each questions. 1 x 10 = 10

- i) Soft solder are made of: a) brass and tin, b) lead and tin, c) brass and lead.
- ii) Coolant is used to: a) cool tool, b) cool job, c) cool tool and job.
- iii) Percentage of carbon in cast iron: a) 1 to 1.5, b) 3 to 4, c) 7 to 9.
- iv) The sharpening action of grinding wheel is done through: a) truing, b) dressing, c) balancing.
- v) The angle of Dot punch is a) 30° b) 60° , c) 90° .
- vi) Hack saw blade is made of: a) brass, b) gun metal, c) HSS.
- vii) Steel rule made of: a) stainless steel, b) cast steel, c) mild steel.
- viii) Vernier caliper discovered by: a) Palmer, b) Piere Vernier, c) Joshep vernier
- ix) 0.01 mm is equal to: a) 100 micron, b) 10 micron, c) 1 micron.
- x) Upper limit of dimension –lower limit of dimension = a) Tolerance, b) Fit c) Limit .

Q3. Write the expanded form of the followings: $1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C2H2 iv) CO2 v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS

Q4. Choose the correct option 1 x 15 = 15

- i) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
- ii) When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
- iii) The staff excluded are eligible for night duty allowance
- iv) New Pension scheme has been introduced w.e.f. 01.01.2006
- v) Standard Form No. 5 is used for issuance of Minor Penalties
- vi) Zyglo test is done to know the internal flaws
- vii) To know Surface Crack UST is conducted
- viii) SWL stands for Special Working Load
- ix) Surface cracks are detected with the help of DPT
- x) 10^{-3} is the least count of micrometer in Standard/British System
- xi) Hacksaw blades are made of high carbon steel
- xii) Full form of HSS is High Speed steel
- xiii) Full form of TIG tungsten inert gas welding.
- xiv) Full form of HSD is High surface Density
- xv) Full form of ICF is Indian Coach factory

PART-B

Answer any five

10 x 5 =50

- Q5. What is Limit, Fit and Tolerance? Explain in brief.
- Q6 . What is Heat Treatment? What are the different methods and process of heat treatment? Explain briefly
- Q7.. a) Why are taper and convexity provided in Flat file?
b) Explain the uses of Jig and Fixture?
- Q8. Draw neat sketch of any two of the following and label the parts.
a) Flat file. b) Micrometer (outside), c) Ball Peen Hammer, d) Morse Taper Shank Twist Drill.
- Q9. What is cutting fluid? What are the characteristics of cutting fluid? How does it differ from Lubricant?
- Q10. Differentiate between:
(a)Drilling and Boring, (b) Annealing and hardening , (c) Cold working and Hot working
(d) Welding joint and coupling joint (e) Welding and soldering,

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr. Instructor-I (Electrical)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

Q1. Fill in the blanks:

1X20 = 20

- a) The speed of 4 poles, 50Hz synchronous machine is -----
- b) To obtain the high voltage and low current the batteries should be connected in-----
- c) Power P in an AC circuit is expressed by-----
- d) No load losses in a transformer is also called-----
- e) Ratio of lead to tin in a soft soldering wire is -----
- f) The use of electromagnet is _____.
- g) According to Joule's Law heat produced = _____.
- h) In star connection the phase current is ----- the line current.
 - i) _____ is used to measure the specific gravity of a liquid.
- j). One horse power = _____ Watts
- k) Unit of specific resistance = _____.
- l) Fuse is connected with the circuit in _____.
- m) The filament of a incandescent lamp is made of _____ material.
- n) If three capacitors of same capacitance (C) are connected in series then their equivalent capacitance = _____.
- o) The use of electromagnet is _____.
- p) Alternators are rated in -----
- q) Transformers are rated in -----
- r) EMF is measured in -----
- s) The SI unit of force is -----
- t) The frequency of DC supply -----

Q2 . Tick the correct answer

1X10 = 10

- a) Ampere meter measures : voltage/power/ current/all
- b) Transformer is used to increase : Volatage/Frequency/Current/All
- c) The atom is composed of : electron/proton/neutron/All
- d) Ferromagnetic substances are :Good Insulator/Good Conductor/Strong Magnetic/Semiconductor
- e) The general height of street light is :2-3m/3-4m/4-5m/5-6m
- f) Which is the best conductor :Gold/Silver/Copper/Aluminum
- g) Which motor has more starting torque : Slipring/Squralcage/DC series/DC Shunt
- h) Which lamp draw more current :40W/25W/100W/Same for all
- i) The fuse wire is inserted in : series/parallel/both/ none
- j) Temperature limit of class E-insulation : 50°C/80°C/120°C/500°C

Q3. Write TRUE or FALSE

1X10 = a)

- a) Resistance of carbon filament rises with the rise in temperature.
- b) Induction Motor runs at synchronous speed.
- c) Two capacitors of 4 farad each are connected in parallel equivalent capacitance will be 8 F
- d) An energy meter would record one unit if 1-kilo watt of power were used for 1 hour.
- e) Autotransformer works on the principle of mutual induction.
- f) Starter is used in medium and large motors to limit their starting currents
- g) Lead sheath wiring s not suitable for damp situation.
- h) The medium voltage is 650V and above.
- i) Maximum demand is greater than connected load.
- j) CTS/PVC wiring is used in workshops.

Q4 Match the following

2X5 = 10

- | | |
|-------------------|--|
| I. Generator | a) 2 nd Law of thermodynamics |
| II. Motor | b) Fleming's Right Hand Rule |
| III. Transformer | c) Fleming's Left Hand Rule |
| IV. Electric Iron | d) Joule's Law |
| V. Refrigerator | e) Faraday's Law |

Group-B

(Answer any five questions)

5X10 = 50

- Q5 a) State the laws of Resistance?
b) What is short circuit?
c) A 10 Amps of current is distributed in circuit having two branches when Connected on 220- volt supply. If the resistance of one branch is 20 ohm, the resistance of the other branch is 10 ohm. Find out power taken by both the branches.
- Q6. a) What are conductor, insulator and semiconductor? Give example.
b) What are the ranges of voltage according to IE rules? What is the supply frequency of India?
c) Write the use of the following materials: mica, porcelain, PVC, Empire cloth, carbon, silver and nichrome.
- Q7. a) Describe different types of connection of 3 phase transformer?
b) What happens, if as DC sources applied to primary winding of transformer?
- Q8. . a) Define the followings:
i) Phase, ii) Root Mean Square value, iii) Average value.
b) How power factor can be improved?
- Q9. a) On what principle a DC generator works ?
b) A 4-pole DC generator with 400-armature conductor operating with a useful flux 0.04 waver is lap wound and is running at 1200 rpm. Calculate the EMF induced in its armature.
- Q10. a) How does a Capacitor store energy?
b) On what factors the capacity of a condenser depends?
c) What are the uses of capacitor?
d) Three capacitors of 5, 10 and 20 μ F are connected in i) series and ii) parallel in each case, find the total capacity of circuit.
- Q11. a) What is temp. coefficient of resistance?
b) A coil has a resistance of 100 ohm at 20⁰C. What is its resistance at 50⁰C? Temp. coefficient of resistance is 0.004/⁰C?

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr. Instructor-I (Welder)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

Q1. Fill in the blanks:

- a) The strongest permanent joint is -----
- b) The easy position to weld is -----
- c) In case of flash back first close the ----- cylinder valve then close the-----
----- cylinder valve.
- d) Pressure in the Dissolve Acetylene cylinder is ----- kgf/cm^2 & pressure of
Oxygen cylinder is ----- kgf/cm^2 .
- e) ----- is done to relieve the internal stress in a weld.
- f) The current range for 1.6mm dia wire in MAG welding is-----
- g) The temperature of a neutral flame is----- $^{\circ}\text{C}$.
- h) DA cylinder must be kept in ----- position while welding.
- i) Root gap is not required for _____ joints.
- j) Diameter of 10SWG electrode is _____ mm

Q2. State the following whether "TRUE" or "FALSE".

1 x 15 = 15

- i) B2 type electrode is used for MMAW where base metal is mild steel.
- ii) The moment of a force about an axis is vector .
- iii) Popping usually occurs due to pre-ignition of gasses.
- iv) For DCSP , the work-piece is connected to the negative terminal of the welding machine..
- v) ----- welding is generally adopted in the repair of broken heavy parts..
- vi) For cutting purpose ,LPG is less advantageous over acetylene gas.
- vii) Arc voltage increases with increase in arc length.
- viii) Deposition of filler metal increases with increase in current.
- ix) Penetration is least for DCRP arc welding.
- x) Joining of two pieces of metal sheet by fusible alloy is called soldering.
- xi) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
- xii) When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
- xiii) The staff excluded are eligible for night duty allowance
- xiv) New Pension scheme has been introduced w.e.f. 01.01.2006
- xv) Zyglo test is done to know the internal flaws

Q3. Write the expanded form of the followings:

$1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C2H2 iv) CO2 v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix)
RDSO x) COS

Part-II

Answer any Six from the following:

10 x 6 = 60

- Q4. What do you mean by flash back and back fire?
- Q5. Name the types of joints and positions in arc welding.
- Q7. . What are the types of flames in gas welding? Define them.
- Q8. Define polarity. What are the types of polarity?
- Q9. Write about arc length and its effects.
- Q10. Distinguish between O₂ and DA cylinders.
- Q11. Describe with neat diagram MAG (CO₂) welding.
- Q12. Name the different types of machines in arc welding. Write about advantages and disadvantages of AC and DC currents.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr. Instructor-I (Diesel/Mech)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

- Q.1 (A) Fill in the blanks with appropriate comments 1x 25 =25
- a No of main bearing in WDM₂ locomotive is -----
 - b Main objective of using Turbo supercharger in Diesel Locomotive is to increase -----
 - c ----- lubrication system is provided for lubricating suspension bearing of Diesel locomotives (WDM₂)
 - d No. of blades in radiator fan in WDM₂ locomotive is -----
 - e Viscosity of Lube oil is expressed in -----.
 - f High exhaust temperature is the indication of
 - g Injection Pressure of fuel oil is made high for atomization of oil and ----- against compressed air
 - h Atomization of fuel is required to increase ----- Of fuel for Oxygen to react
 - i Inner surface of liner is Lubricated to increase the life of -----
 - j Diffuser in turbo supercharger increase the ----- of intake air
 - k For cooling Diesel Locomotive components, water is supplied to the components indirection
 - l With in the compressor crank case block, both negative and positive pressures are generated. They are and
 - m Hardness of cam lobe must than that of cam roller
 - n Inner diameter of liner sleeve must bethan outer diameter of Liner
 - o Hardness of Split gear key must be than that of the crank shaft.
 - p Torque required for tightening Fuel "T" jumper bolt is -----
 - q POH of Locomotive is carried out after every -----Years
 - r Crank vacuum is measured by
 - s Baffle plates are provided inside the Fuel oil tank to reduce -----
 - t Cetrifuge is used in WDM₂ locomotive for better -----
 - u Impressed stores is controlled in shed /Shop by -----
 - v NSR No. Bears-----digit number.
 - w LM-32 is used to draw material from -----
 - x Full form of HSD oil is -----
 - y -----is used to lubricate Gear/Pinion arrangement of WDM₂ locomotive
- Q.1 (B) Write "True" or "False" 1x 25 =25
- a Devnagari is the script of Hindi
 - b Regional Language is used first in writing the name of a station.
 - c Andaman, Nicobar, Island is in "A" region.
 - d Mega Bytes indicates the capacity of storage device
 - e Expanded form of ALU is Arithmetic and Logic Unit
 - f Expanded form ASCII code is American Standard Code for Information and Interface.
 - g MS-Office is an Operating System soft ware
 - h Combination of bits is called Byte
 - i Hard disk is a primary storage device
 - j There is a provision of Child Care leave for an woman employee for a total period 730 days
 - k HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
 - l When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
 - m The staff excluded are eligible for night duty allowance

n	New Pension scheme has been introduced w.e.f. 01.01.2006
o	Standard Form No.11 is used for issuance of Minor Penalties
p	Objective of Supercharging is to feed pressurized air to the engine cylinder.
q	Air-Fuel ratio for Diesel engine is 5:1
r	Tractive effort is the maximum force that can be applied by the vehicle.
s	There are 08 nos of main bearings in WDM ₂
t	Dry-Run test ensures the proper movement of fuel oil linkage
u	Load Box test ensures hauling capacity of Locomotive
v	Blow-By test ensures the sealing of combustion chamber
w	TSC comprises five numbers of casings
x	SFC ensures the overall health of Diesel Locomotive
y	Effective Dynamic brake operation increases the frequency of wheel turning

Part-II

Answer any Five from the following:

Q2. Write notes on

a) SFC, b) Dry run test, c) Blow-By test, d) Fuel oil orifice test

Q.3. What are the latest 15 modifications of Diesel Locomotives?

Q.4 Describe in brief the overhauling process of TSC ?

Q.5 A Diesel Locomotive is experiencing a repeated Hot Engine alarms. What may be the probable causes for this trouble and subsequent remedial measures?

Q.6. Discuss necessary steps to be taken to minimize Lube Consumption in shed.

Q.7. Describe in brief the air brake system in WDM₂ Locomotive.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr Instructor-I (Machinist)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-A

Write any seven questions from Part-A. All questions carry equal marks

Q1. Fill in the blanks with appropriate comment: 1 x 10 = 10

- a) Wheel and axle are the example of _____Fit.
- b) Drill jig is to hold the job and guide _____.
- c) Least count of Micrometer in Metric System is _____.
- d) Three jaw chuck is also known as ----- chuck
- e) Least count of Vernier Caliper in Metric System is _____.
- f) Vernier Bevel Protector is used to measure the----- of a job.
- g) Taps are used to cut _____.
- h) Twist drills are made of _____.
- i) Hammers are made of _____.
- j) Files are generally made up of -----

Q2. Choose the correct option against each questions. 1 x 10 = 10

- i) Soft solder are made of: a) brass and tin, b) lead and tin, c) brass and lead.
- ii) Coolant is used to: a) cool tool, b) cool job, c) cool tool and job.
- iii) Percentage of carbon in cast iron: a) 1 to 1.5, b) 3 to 4, c) 7 to 9.
- iv) The sharpening action of grinding wheel is done through: a) truing, b) dressing, c) balancing.
- v) The angle of Dot punch is a) 30° b) 60° , c) 90° .
- vi) Hack saw blade is made of: a) brass, b) gun metal, c) HSS.
- vii) Steel rule made of: a) stainless steel, b) cast steel, c) mild steel.
- viii) Vernier caliper discovered by: a) Palmer, b) Piere Vernier, c) Joshep vernier
- ix) 0.01 mm is equal to: a) 100 micron, b) 10 micron, c) 1 micron.
- x) Upper limit of dimension –lower limit of dimension = a) Tolerance, b) Fit c) Limit .

Q3. Write the expanded form of the followings: $1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C2H2 iv) CO2 v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS

Q4. Choose the correct option 1 x 15 = 15

- i) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
- ii) When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
- iii) The staff excluded are eligible for night duty allowance
- iv) New Pension scheme has been introduced w.e.f. 01.01.2006
- v) Standard Form No. 5 is used for issuance of Minor Penalties
- vi) Zyglo test is done to know the internal flaws
- vii) To know Surface Crack UST is conducted
- viii) SWL stands for Special Working Load
- ix) Surface cracks are detected with the help of DPT
- x) 10^{-3} is the least count of micrometer in Standard/British System
- xi) Hacksaw blades are made of high carbon steel
- xii) Full form of HSS is High Speed steel
- xiii) Full form of TIG tungsten inert gas welding.
- xiv) Full form of HSD is High surface Density
- xv) Full form of ICF is Indian Coach factory

PART-B

Answer any five

10 x 5 =50

Q5. What is Limit, Fit and Tolerance? Explain in brief.

Q6 . What is Heat Treatment? What are the different methods and process of heat treatment? Explain briefly

Q7.. a) Why are taper and convexity provided in Flat file?
b) Explain the uses of Jig and Fixture?

Q8. Draw neat sketch of any two of the following and label the parts.
a) Flat file. b) Micrometer (outside), c) Ball Peen Hammer,
d) Morse Taper Shank Twist Drill.

Q9. What is cutting fluid? What are the characteristics of cutting fluid? How does it differ from Lubricant?

Q10. Differentiate between:
(a)Drilling and Boring, (b) Annealing and hardening , (c) Cold working and Hot working (d) Welding joint and coupling joint (e) Welding and soldering,

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr Instructor-I (Turner)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-A

Write any seven questions from Part-A. All questions carry equal marks

Q1. Fill in the blanks with appropriate comment: 1 x 10 = 10

- a) Wheel and axle are the example of _____Fit.
- b) Drill jig is to hold the job and guide _____.
- c) Least count of Micrometer in Metric System is _____.
- d) Three jaw chuck is also known as ----- chuck
- e) Least count of Vernier Caliper in Metric System is _____.
- f) Vernier Bevel Protector is used to measure the----- of a job.
- g) Taps are used to cut _____.
- h) Twist drills are made of _____.
- i) Hammers are made of _____.
- j) Files are generally made up of -----

Q2. Choose the correct option against each questions. 1 x 10 = 10

- i) Soft solder are made of: a) brass and tin, b) lead and tin, c) brass and lead.
- ii) Coolant is used to: a) cool tool, b) cool job, c) cool tool and job.
- iii) Percentage of carbon in cast iron: a) 1 to 1.5, b) 3 to 4, c) 7 to 9.
- iv) The sharpening action of grinding wheel is done through: a) truing, b) dressing, c) balancing.
- v) The angle of Dot punch is a) 30° b) 60°, c) 90°.
- vi) Hack saw blade is made of: a) brass, b) gun metal, c) HSS.
- vii) Steel rule made of: a) stainless steel, b) cast steel, c) mild steel.
- viii) Vernier caliper discovered by: a) Palmer, b) Piere Vernier, c) Joshep vernier
- ix) 0.01 mm is equal to: a) 100 micron, b) 10 micron, c) 1 micron.
- x) Upper limit of dimension –lower limit of dimension = a) Tolerance, b) Fit c) Limit .

Q3. Write the expanded form of the followings: $1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C2H2 iv) CO2 v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS

Q4. Choose the correct option 1 x 15 = 15

- i) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
- ii) When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
- iii) The staff excluded are eligible for night duty allowance
- iv) New Pension scheme has been introduced w.e.f. 01.01.2006
- v) Standard Form No. 5 is used for issuance of Minor Penalties
- vi) Zyglo test is done to know the internal flaws
- vii) To know Surface Crack UST is conducted
- viii) SWL stands for Special Working Load
- ix) Surface cracks are detected with the help of DPT
- x) 10⁻³ is the least count of micrometer in Standard/British System
- xi) Hacksaw blades are made of high carbon steel
- xii) Full form of HSS is High Speed steel
- xiii) Full form of TIG tungsten inert gas welding.
- xiv) Full form of HSD is High surface Density
- xv) Full form of ICF is Indian Coach factory

PART-B

Answer any five

10 x 5 =50

- Q5. What is Limit, Fit and Tolerance? Explain in brief.
- Q6 . Describe the Principle Parts of a Centre Lathe Machine in brief.
- Q7 What is Taper? What are the different methods of taper turning used. Explain briefly.
- Q8. What are the different operations and processes performed in Centre Lathe? Explain briefly.
- Q9. Draw neat sketch of any two of the following and label the parts.
a) Flat file. b) Micrometer (outside), c) Ball Peen Hammer, d) Morse Taper Shank Twist Drill.
- Q10. What is cutting fluid? What are the characteristics of cutting fluid? How does it differ from Lubricant?
- Q11. Differentiate between:
(a)Drilling and Boring, (b) Annealing and hardening , (c) Cold working and Hot working (d) Welding joint and coupling joint (e) Welding and soldering,
- Q12. What is Safety? What are its importance in workshop? Explain the safety precaution you adopt while working in your machine.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr Instructor-I (Painter)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100
hours

Time-3

Part-A

Write any seven questions from Part-A. All questions carry equal marks

Q1. Fill in the blanks with appropriate comment: 1 x 10 = 10

- a) The main components of paints are ----- and -----.
- b) Pigments are used to give desired-----
- c) Binders are used for -----
- d) d) Titanium dioxide is an example of -----
- e) Resin or gum are the example of -----
- f) powder coatings are used for painting -----.
- g) Linseed oil is used as ----- agent
- h) Red lead is used as -----
- i) Opacity is the property of -----.
- j) Spay painting is done by -----

k) Q2. Write True or false against the following statement: 1 x 10 = 10

- l) Suction spray gun is used for spray painting. .
- m) Principal ingredients employed in mixing paints are pigments, driers and thinners.
- n) White lead is an example of thinner..
- o) Lithopone is an example of driers..
- p) Varnishes are used for the preservation of surfaces to be painted.
- q) Shellac gum is mostly available in India.
- r) Nitrocellulose is the basis of most lacquers.
- s) plasticizer is used as varnishes.
- t) Blister is a paint defect .
- u) The wash coat is a very thin coat used on wood .

Q3. Write the expanded form of the followin $1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C₂H₂ iv) CO₂ v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) CO

Q4. Choose the correct op 1 x 5 = 5

- i) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
- ii) When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
- iii) The staff excluded are eligible for night duty allowance
- iv) New Pension scheme has been introduced w.e.f. 01.01.2006
- v) Standard Form No. 5 is used for issuance of Minor Penalties

PART-B

Answer any six questions

10 x 6 =60

- Q5. Write A Schedule in Painting of coaches.
- Q6. Write C Schedule in Painting of coaches.
- Q7. Write different Types of painting defects and their remedies.
- Q8. Write down painting tools and painting safety equipments.
- Q9. What is Phosphating? Discuss how it is done.
- Q10 Write short notes on:
a) Pigments b) Binders c) thinner d) Varnish
- Q11. Describe the process of Polyurethane painting in ICF coaches and state its advantages.
- Q12 Describe different surface preparation techniques before painting.

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr Instructor-II (Fitter)** / BTC under PSTC-against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-A

Write any seven questions from Part-A. All questions carry equal marks

Q1. Fill in the blanks with appropriate comment: 1 x 10 = 10

- a) Wheel and axle are the example of _____Fit.
- b) Drill jig is to hold the job and guide _____.
- c) Least count of Micrometer in Metric System is _____.
- d) Three jaw chuck is also known as ----- chuck
- e) Least count of Vernier Caliper in Metric System is _____.
- f) Vernier Bevel Protector is used to measure the----- of a job.
- g) Taps are used to cut _____.
- h) Twist drills are made of _____.
- i) Hammers are made of _____.
- j) Files are generally made up of -----

Q2. Choose the correct option against each questions. 1 x 10 = 10

- i) Soft solder are made of: a) brass and tin, b) lead and tin, c) brass and lead.
- ii) Coolant is used to: a) cool tool, b) cool job, c) cool tool and job.
- iii) Percentage of carbon in cast iron: a) 1 to 1.5, b) 3 to 4, c) 7 to 9.
- iv) The sharpening action of grinding wheel is done through: a) truing, b) dressing, c) balancing.
- v) The angle of Dot punch is a) 30° b) 60° , c) 90° .
- vi) Hack saw blade is made of: a) brass, b) gun metal, c) HSS.
- vii) Steel rule made of: a) stainless steel, b) cast steel, c) mild steel.
- viii) Vernier caliper discovered by: a) Palmer, b) Piere Vernier, c) Joshep vernier
- ix) 0.01 mm is equal to: a) 100 micron, b) 10 micron, c) 1 micron.
- x) Upper limit of dimension –lower limit of dimension = a) Tolerance, b) Fit c) Limit .

Q3. Write the expanded form of the followings: $1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C2H2 iv) CO2 v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS

Q4. Fill in the blanks: 2 x 5 =10

- a) Least count of Steel Rule In Metric System is _____.
- b) Least count of Micrometer in Metric System is _____.
- c) Least count of Vernier Height Gauge in British System is _____.
- d) Least count of Vernier Caliper in Metric System is _____.
- e) Least count of Vernier Bevel Protector is _____.

Q5. Choose the correct option 1 x 5 = 5

- i) HOER applies to all Rly non-gazetted employees excluding employees working Prod unit
- ii) When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
- iii) The staff excluded are eligible for night duty allowance
- iv) New Pension scheme has been introduced w.e.f. 01.01.2006
- v) Standard Form No. 5 is used for issuance of Minor Penalties

PART-B

Answer any five

10 x 5 =50

Q6. Write short notes on any Three of the following:

- a) Steel Rule, b) Micrometer, c) Vernier Caliper,
d) Vernier Bevel Protector, e) Slip Gauges.

Q7 . What is Safety? What are the causes behind accidents ? How will you follow Job safety?

Q8. Write short note on:

- a)Castle nut, b) Lock nut, c) set screws, d) spring washer, e) Knuckle thread

Q9. Draw neat sketch of any two of the following and label the parts.

- a) Flat file. b) Micrometer (outside), c) Ball Peen Hammer,
d) Morse Taper Shank Twist Drill.

Q10. How will you derive these measurements in Vernier Caliper:

- a) 23.46 mm, b) 14.84 mm, c) 2.374",
d) 1.043", e) 1.208".

Q11. Differentiate between:

- (a)Drilling and Boring, (b) Annealing and hardening , (c) Cold working and Hot working (d)
Welding joint and coupling joint (e) Welding and soldering,

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr. Instructor-II (Electrical)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

Q1. Fill in the blanks:

1X15 = 15

- a) The unit of magnetic flux is _____.
- b) The unit of inductance is _____.
- c) The specific gravity of electrolyte in fully charged cell is _____..
- d) In Delta connection , Line voltage is _____.
- e) Auto transformer works on the principle of _____.
- f) The fuse melts because of _____.
- g) Inductive reactance of a coil is measured in _____.
- h) _____ is used to measure the specific gravity of a liquid.
- i) Transformation ratio (K) = _____.
- j) Three phase power in AC circuit (P) = _____.
- k) xi) A diode is used for -----
- l) xii) The unit of inductance is -----
- m) xiii) Alternators are rated in -----
- n) xiv))Transformers are rated in -----
- o) EMF is measured in -----

Q2. Write True or False:

1X15 = 15

- a) The guard wire is firmly connected with earth wire.
- b) Capacity of a battery depends on the size of the plate.
- c) The positive plate of a lead acid cell is spongy lead.
- d) Motor works on the principle of Fleming's left hand rule.
- e) Transformer works on Mutual induction principle.
- f) The induced emf developed in a coil opposes the applied voltage.
- g) Laminated core is used in a transformer to provide more magnetic flux.
- h) Permeability of ferromagnetic material is less than unity.
- i) Rechargeable cell is called secondary cell.
- j) Direction of induced emf can be obtained with the help of Lenz's law.
- k) Resistance of carbon filament rises with the rise in temperature.
- l) Induction Motor runs at synchronous speed.
- m) Two capacitors of 4 farad each are connected in parallel equivalent capacitance will be 8 F
- n) An energy meter would record one unit if 1-kilo watt of power were used for 1 hour.
- o) Autotransformer works on the principle of mutual induction.

Q3. Tick the correct answer

1X10 = 10

Ampere meter measures : voltage/power/ current/all

- I. Transformer is used to increase : Volatage/Frequency/Current/All
- II. The atom is composed of : electron/proton/neutron/All
- III. Ferromagnetic substances are :Good Insulator/Good Conductor/Strong Magnetic/Semiconductor
- IV. The general height of street light is :2-3m/3-4m/4-5m/5-6m
- V. Which is the best conductor :Gold/Silver/Copper/Aluminum
- VI. Which motor has more starting torque : Slipring/Squeralcage/DC series/DC Shunt
- VII. Which lamp draw more current :40W/25W/100W/Same for all

- VIII. The fuse wire is inserted in : series/parallel/both/ none
IX. Temperature limit of class E-insulation : 50°C/80°C/120°C/500°C

Q4. Answer the following

1X10 = 10

- I. Capacity of transformer of WAG₇ loco
- II. Rating of Alternator of general coach
- III. Rating of Alternator of AC coach
- IV. No. of carbon brushes in Traction motor
- V. No. of batteries used in locomotive
- VI. current rating of CCBA
- VII. No. of generator in EOG coaches.
- VIII. Full form of LHB coach
- IX. Function of ARNO.
- X. No of notches in EMU .

Group-B

(Answer any five questions)

5X10 =50

Q5 Answer any two of the following:

Distinguish:

- (i) Electric circuit and magnetic circuit (ii) Primary cell and secondary cell (iii) Electro magnet and permanent magnet.

Q6. a) What is the indication of full charging of an acid cell?
b) What is the method of charging?
c) What are the uses of storage cell?

Q7 a) State the advantages of poly phase over single phase.
b) What is the relation between line current and line voltage with the phase? current and phase voltage for star connection?.

Q8. Write short notes on any two: (i) Permeability (ii) Residual magnetism (iii) Fleming's right hand rule (iv) Lenz's law

Q9. Draw the circuit diagram of twin tube light connection.

Q10. Define the following (any two)

- a)Form factor.
- b)Kirchoff's laws.
- c) Types of DC motors

Q11. a) Define Work, Power and Energy. Write down their units
b) If a motor takes 185 amp at 460V and gives 80HP, what is its efficiency?
How many units will it use per hour?

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr. Instructor-II (Welder)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

Q1. Fill in the blanks:

1 x 15 = 15

- a) Root gap is not required for----- joints..
- b) In case of flash back first close the ----- cylinder valve then close the ----- cylinder valve.
- c) Pressure in the Dissolve Acetylene cylinder is ----- kgf/cm² & pressure of Oxygen cylinder is----- kgf/cm².
- d) The rate of deposition of weld metal very high in -----position..
- e) The electrode stud more than-----mm in length should not be discarded.
- f) For melting of mild steel by gas metal arc welding ----- is a suitable shielding gas.
- g) DA cylinder must be kept in ----- position while welding.
- h) The melting point of mild steel is ----- 0C .
- i) Diameter of 10SWG electrode is----- mm.
- j) Greater diameter pipe of cutting blow pipe always carries _____ gas.
- k) The strongest permanent joint is -----
- l) The easy position to weld is -----
- m) The temperature of a neutral flame is----- 0C
- n) In resistance welding ----- metal is not required.
- o) For joining two pieces of rail ----- welding process is employed.

Q2. State the following whether “TRUE” or “FALSE”.

1 x 10 = 10

- i) B2 type electrode is used for MMAW where base metal is mild steel.
- ii) The moment of a force about an axis is vector .
- iii) Popping usually occurs due to pre-ignition of gasses.
- iv) For DCSP , the work-piece is connected to the negative terminal of the welding machine..
- v) ----- welding is generally adopted in the repair of broken heavy parts..
- vi) For cutting purpose ,LPG is less advantageous over acetylene gas.
- vii) Arc voltage increases with increase in arc length.
- viii) Deposition of filler metal increases with increase in current.
- ix) Penetration is least for DCRP arc welding.
- x) Joining of two pieces of metal sheet by fusible alloy is called soldering.

Q3. Write the expanded form of the followings:

$1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C₂H₂ iv) CO₂ v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS

Part-II

Answer any Six from the following:

10 x 6 = 60

- Q4.** Write down the name of various methods of testing a welded joint. Describe any one method.
- Q5.** What happens if: i) there is no root gap, ii) there is too much gap.
- Q6.** Give any four reasons for weld cracking.
- Q7.** What difficulties you face in welding aluminum and why?
- Q8.** Explain the following terms:- i)crater ii)heat affected zone iii)post weld heat treatment.
- Q9.** Define brazing. State the advantages of brazing. Distinguish between brazing and welding.
- Q10.** Write about manifold systems for gas welding.
- Q11.** Write notes on TIG welding.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr. Instructor-II (Diesel/Mech)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-I

1 x 20 = 20

- I) Number of Engine Cylinders in WDM₂ _____.
- ii) WDM₂ means _____.
- iii) WDS₆ means _____.
- iv) Fuel oil tank capacity of WDM₂ _____.
- v) Lube oil sump capacity WDM₂ _____.
- vi) Cooling water capacity of WDM₂ _____.
- vii) Expresser oil capacity of WDM₂ _____.
- viii) Horse Power of WDM₂ _____.
- ix) Sand capacity of WDM₂ _____.
- x) Axle load of WDM₂ _____.
- xi) Brake cylinders of WDM₂ _____.
- xii) Gear Ratio of WDM₂ _____.
- xiii) Engine speed at idle _____.
- xiv) Engine speed at full _____.
- xv) Engine over speed at _____.
- xvi)) Full speed of radiator fan _____.
- xvii) Wheel diameter of Diesel loco (new) is _____ inch.
- xviii) Type of bogie used in WDM₂ _____.
- xix) Total voltage available in WDM₂ _____.
- xx) Buster air pressure in WDM₂ _____.

Q2. Write the correct answer from the given options:

1x 15 = 15

- i) Intercooler safety valve is set at :50psi/60psi/70psi/80psi
- ii) TSC is driven by :exhaust gas/crank shaft/electric motor/all.
- iii) Lube oil regulating valve is set at : 60psi/45psi/70psi/90psi.
- iv) Engine piston diameter is :9/10/12/15 inch
- v) Water pump delivery is : 650/620/314/324 gpm
- vi) Number of scraper ring in a piston is 1/2/3/4.
- vii) Number of spring door in a engine crankcase is 1/2/3/4.
- viii) Fuel injection pump is driven by : crank shaft/cam shaft/Horizontal shaft/electric motor.
- ix) Fuel tank minimum balance is :500/600/800/1000 Litres
- x) A-9 auto brake handle has :2/3/4/5 positions.
- xi) New Pension scheme is introduced with effect from 1st April 1968
- xii) Head Quarter of South East Central is BSP
- xiii) Indian Railways have 15 Zones.
- xiv) CKP comes under E.Co.Railway
- xv) A railway servant can accumulate 300 days of LHAP at his leave credit during his entire period of service .

Q3. Write the expanded form of the followings:

$1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C2H2 iv) CO2 v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS

Part-II

Answer any Five from the following:

10 x 5 = 50

- Q4.** Write Down The air Brake System of Diesel Locomotive With the help of neat sketch.
- Q5.** What do you mean by SFC? Calculate SFC of Diesel Loco assuming following data:-
Fuel consumption=700Lt., Hauling Load=2887.2T, Distance travelled=100km.
- Q6.** Write short notes on
a) Air drier b) Centrifuge c) car body filter d) ALCO-251 Cylinder Head
- Q7.** Describe in brief the overhauling process of TSC.
- Q8.** Describe in brief the overhauling process of T/Motor.
- Q9.** What are the latest 15 modifications of Diesel Locomotives?
- Q10.** Write the latest 15 modifications incorporated in Diesel Locomotives.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr Instructor-II (Machinist)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-A

Q1. Fill in the blanks with appropriate option from given in the bracket: 1 x 20 = 20

- i) Clapper Box is fitted in _____ machine.
- ii) Machine Bed is made of _____.
- iii) Files are made of _____.
- iv) Arbors are used in _____ machine.
- v) Boring is an operation of _____ a hole.
- vi) Dies are used to cut _____ threads
- vii) Fits are of _____ types
- viii) Diamond point nose chisels are used to cut _____
- ix) Included angle of Prick punch is _____
- x) Flute is provided in _____
- xi) Hand taps are available in set of _____
- xii) Set of teeth are provided in _____
- xiii) The difference between the lower limit and the upper limit is known as _____
- xiv) Wheel and axle are the example of _____ Fit.
- xv) Files are made of _____.
- xvi) Hacksaw blades are made of _____.
- xvii) Included cutting angle of MTS drill is _____.
- xviii) Cutting angle of Flat chisel is _____
- xix) Least count of Steel Rule in British System is _____.
- xx) Hermaphrodite calipers are used to mark _____ lines from a prepared

Q2. State the following whether "TRUE" or "FALSE". 1 x 15 = 15

- i) At the time of hardening metal become Harden.
- ii) Tempering can reduce the Softness.
- iii) Aluminum Oxide wheels are Soft.
- vi) Silicon Carbide wheels are Medium hard wheel.
- vii) Continuous chips are produced during machining of hard metal
- viii) Temperature can be determined by observing the colour of flame
- ix) There are seven parameters for describing the nomenclature of cutting tool.
- x) Pit-wheel lathe machine is used to turn the wheel of Locomotive and coaches
- xi) Boring machine is used to produce a new hole.
- xii) Honing is a surface finishing process.
- xiii) Hobbing is a gear cutting process.
- xiv) Tail-stock is a part of a drilling machine.
- xv) taper turning attachment is attached with Lathe machine.

Q3. Write the expanded form of the followings: $1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C2H2 iv) CO2 v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS

Part-B

Answer any five questions

10 x 5 = 50

- Q4. What is Safety? What are its importance in workshop? Explain the safety precaution you adopt while working in your machine.
- Q5. Define Drilling. Explain different types of drilling machine used.
- Q6. Describe the principle parts of a Column and Knee type Milling machine.
- Q7. What is milling cutter? How do you classify milling cutter? Explain briefly.
- Q8. What is Heat Treatment? For what purpose it is done? What are the different methods and process of heat treatment? Explain briefly.
- Q9. Write short note on: (any Two)
a) Horizontal Boring Machine, b) Vertical Boring Machine, c) Jig Boring Machine.
- Q10 Distinguish between the following: (any Five)
a) Drilling and Boring, b) Turning and Milling, c) Micrometer and Vernier Caliper, d) Hardening and Tempering, e) Inch Micrometer and Metric Micrometer.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr Instructor-II (Turner)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-A

Write any seven questions from Part-A. All questions carry equal marks

- Q1. Fill in the blanks with appropriate comment: 1 x 15 = 15
- I. Wheel and axle are the example of _____ Fit.
 - II. Clapper Box is fitted in _____ machine.
 - III. Machine Bed is made of _____.
 - IV. Files are made of _____.
 - V. Arbors are used in _____ machine.
 - VI. Boring is an operation of _____ a hole
 - VII. Least count of Micrometer in Metric System is _____.
 - VIII. Three jaw chuck is also known as ----- chuck
 - IX. Least count of Vernier Caliper in Metric System is _____.
 - X. Vernier Bevel Protector is used to measure the----- of a job.
 - XI. Taps are used to cut _____.
 - XII. Twist drills are made of _____.
 - XIII. Hammers are made of _____.
 - XIV. Files are generally made up of -----
 - XV. Taper turning attachment is used in ----- machine
- Q2. Choose the correct option against each questions. 1 x 10 = 10
- i) Soft solder are made of: a) brass and tin, b) lead and tin, c) brass and lead.
 - ii) Coolant is used to: a) cool tool, b) cool job, c) cool tool and job.
 - iii) Percentage of carbon in cast iron: a) 1 to 1.5, b) 3 to 4, c) 7 to 9.
 - iv) The sharpening action of grinding wheel is done through: a) truing, b) dressing, c) balancing.
 - v) The angle of Dot punch is a) 30° b) 60° , c) 90° .
 - vi) Hack saw blade is made of: a) brass, b) gun metal, c) HSS.
 - vii) Steel rule made of: a) stainless steel, b) cast steel, c) mild steel.
 - viii) Vernier caliper discovered by: a) Palmer, b) Piere Vernier, c) Joshep vernier
 - ix) 0.01 mm is equal to: a) 100 micron, b) 10 micron, c) 1 micron.
 - x) Upper limit of dimension –lower limit of dimension = a) Tolerance, b) Fit c) Limit .
- Q3. Write the expanded form of the followings: $1\frac{1}{2} \times 10 = 15$
- i) CWM ii) CRSE iii) C2H2 iv) CO2 v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS
- Q4. Choose the correct option 1 x 10 = 10
- i) HOER applies to all Rly non–gazetted employees excluding employees working Prod unit
 - ii) When SC/ST candidates apply for the non-reserved posts, age relaxation is not allowed
 - iii) The staff excluded are eligible for night duty allowance
 - iv) New Pension scheme has been introduced w.e.f. 01.01.2006
 - v) Standard Form No. 5 is used for issuance of Minor Penalties
 - vi) To know Surface Crack UST is conducted
 - vii) Surface cracks are detected with the help of DPT
 - viii) 10^{-3} is the least count of micrometer in Standard/British System
 - ix) Hacksaw blades are made of high carbon steel
 - x) Full form of HSS is High Speed steel

PART-B

Answer any five

10 x 5 =50

- Q5. What is Limit, Fit and Tolerance? Explain in brief.
- Q6 . Describe the Principle Parts of a Centre Lathe Machine in brief.
- Q7 What is Taper? What are the different methods of taper turning used. Explain briefly.
- Q8. What are the different operations and processes performed in Centre Lathe? Explain briefly.
- Q9. Draw neat sketch of any two of the following and label the parts.
a) Flat file. b) Micrometer (outside), c) Ball Peen Hammer, d) Cutting tool
- Q10. What is cutting fluid? What are the characteristics of cutting fluid? How does it differ from Lubricant?
- Q11. Differentiate between:
(a)Drilling and Boring, (b) Annealing and hardening , (c) Cold working and Hot working (d) Welding joint and coupling joint (e) Welding and soldering,
- Q12. What is Safety? What are its importance in workshop? Explain the safety Precaution you adopt while working in your machine.

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr Instructor-II (Painter)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-A

Write any seven questions from Part-A. All questions carry equal marks

- Q1. Fill in the blanks with appropriate comment: 1 x 10 = 10
- a) The main components of paints are ----- and -----.
 - b) Pigments are used to give desired-----
 - c) Binders are used for -----
 - d) Titanium dioxide is an example of -----
 - e) Resin or gum are the example of -----
 - f) Powder coatings are used for painting -----.
 - g) Linseed oil is used as ----- agent
 - h) Red lead is used as -----
 - i) Graining comb is a -----.
 - j) Spay painting is done by -----
- Q2. Write True or false against the following statement: 1 x 10 = 10
- I. Suction spray gun is used for spray painting. .
 - II. Principal ingredients employed in mixing paints are pigments, driers and thinners.
 - III. White lead is an example of thinner..
 - IV. Lithopone is an example of driers..
 - V. Varnishes are used for the preservation of surfaces to be painted.
 - VI. Shellac gum is mostly available in India.
 - VII. Nitrocellulose is the basis of most lacquers.
 - VIII. Plasticizer is used as varnishes.
 - IX. Blister is a paint defect.
 - X. The wash coat is a very thin coat used on wood.
- Q3. Write the expanded form of the followings: $1\frac{1}{2} \times 10 = 15$
- i) CWM ii) CRSE iii) C₂H₂ iv) CO₂ v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS
- Q4. Choose the correct option: 1 x 5 = 5
- a) Head Quarter of SECR is – (Bilaspur , Bhubaneswar, Raipur)
 - b) Chief administrator of Zonal Railway is – (CME, DRM, GM)
 - c) Head of the Mechanical Department of Indian Railways is- (CME, MM, GM)
 - d) Kharagpur workshop is a – (Maintenance shop, Production unit, maintenance Depot)
 - e) Number zones of Indian Railways is-(15, 16,17)

PART-B

Answer any six questions

10 x 6 =60

- Q5. Write "A" Schedule in Painting of coaches.
- Q6. a) What do you mean by thinner? How does it destroy the gloss of paint?
b) What do you mean by the covering power of paint?
- Q7. Write different Types of painting defects and their remedies.
- Q8. Write down painting tools and painting safety equipments.
- Q9. What are the characteristics of a good paint.
- Q10 Write short notes on:
a) Pigments b) Binders c) Filler d) Varnish
- Q11. Describe the process of Polyurethane painting in ICF coaches and state its advantages.
- Q12. Describe different surface preparation techniques before painting.

South Eastern Railway
Mechanical department

Sub: Model Question Paper for selection of Instructors in order to fill up the vacant ex-cadre posts of **Jr Instructor-II (Carpenter)** / BTC under PSTC-KGP against WPO/KGPW's letter No.1287/Panel/STC & BTC/3197 dated 05-09-2013

Full Marks-100

Time-3 hours

Part-A

Write any seven questions from Part-A. All questions carry equal marks

Q1. Fill in the blanks with appropriate comment: 1 x 10 = 10

- (i) _____ deals with all works of a carpentry such roofs, floors, partition etc of a
- (ii) Building.
- (iii) _____ deals with the making of doors, windows, cupboards etc.
- (iv) _____ is the basic material used for any class of wood working.
- (v) After a tree is felled it is striped of its branches and is then known as _____
- (vi) Sissu is _____ than Teak.
- (vii) Rules, try square, Mitre square , marking knife are called _____ tools.
- (viii) Batten is a type of _____
- (ix) Tenon is a _____ of type of saw.
- (x) Bow saw is used for cutting _____.
- (xi) The commonest form of edge joint is known as _____.

Q2. Write true or false against each statement . 1 x 15 = 15

- I. Molding is the process of cutting concave, convex and other curve surface along the length
- II. of a piece of a wood.
- III. Rebating is the process of making a recess taken out of the edge a piece of wood
- IV. The dovetail joint is probably the weakest of all corner joint.
- V. The dowel joint can not be used as farming joint in the place of mortise and tenon joint
- VI. The angle at which the blade is set in the body of the plain fixes the cutting angle.
- VII. Rasps and file are not useful for cleaning up some curve surfaces .
- VIII. The pincer is mainly used for pulling out nails .
- IX. Sash cramp is used for holding wide work
- X. Mallet is a wooden chisel.
- XI. Gimlet is a marking tool.
- XII. G cramp is used for holding bigger work.
- XIII. The band saw is used for cut wood by means of endless metal saw band.
- XIV. Jig saw is also known as circular saw.
- XV. Board is a form of timber.
- XVI. Natural seasoning of wood does not give better result.

Q3. Write the expanded form of the followings: $1\frac{1}{2} \times 10 = 15$

- i) CWM ii) CRSE iii) C2H2 iv) CO2 v) ICF vi) LDCE vii) Dy.CMM viii) CLW ix) RDSO x) COS

PART-B

Answer any six

10 x 6 =50

- Q5. What is difference between hard wood and soft wood ? Describe the process of seasoning wood .
- Q6. Name at least 5 types of different wood screw and describe with neat sketch.
- Q7. Sketch and describe one of the following joints made in the carpentry shop :
a) Halving joints b) Mortise and tenon joints
- Q8. Sketch and describe one of the following tools used in the carpentry shop
i) Saws ii) Chisels
- Q9. What do you mean by glues ? Describe with neat sketch butt or rubbed joint using glues.
- Q10. Name different type of planes used in carpentry shop and show with neat sketch the different component of jack plane.
- Q 11. Write short notes on the following :
i) Babul ii) Planks iii) Trammel iv) Claw hammer v) Bench vice
