

EASTERN RAILWAY
Signal and Telecommunication Branch
Question Paper for Instructor (Sig)

Duration : 2.5 Hrs.

Total : 100 Marks

SECTION A

Answer All Questions (Each carry one mark)

50 x 1 M = 50 marks

I. True or False

- 1) Whenever point set and locked in normal ND & NC contact make. (True/False)
- 2) Calling On signal can be placed on last stop signal. (True/False)
- 3) Overlap setting mandatory for calling on signal (True/False)
- 4) Disconnection for testing of point for obstruction test is not required. (True/False)
- 5) Catch siding protects block section and slip siding protect station section. (True/False)
- 6) Shunt signal can be placed below first stop signal. (True/False)
- 7) Isolation is required for station with standard 1 system of interlocking. (True/False)
- 8) Amplitude modulation technique is used in digital axle counter to avoid the trolley suppression track circuit. (True/False)
- 9) When UCR picks up, ASR concerned will be dropped in PI or in RRI. (True/False)
- 10) Transmitter coils are always connected inside the rail. (True/False)

II. Fill in the blanks

- 11) Provision of para _____ of GR/SR(2) with reference to setting of points against the blocked line in rear on double line section and at either ends on single line section shall be checked.
- 12) Trolley competency certificate is valid for _____ year.
- 13) Periodicity of foot plate inspection carried out by SSE is _____ in _____ months..
- 14) Average life of electrical point machine in Suburban section is _____ years.

- 15) Specific gravity of the discharged lead acid cell is _____ in terms of hydrometer reading.
- 16) Carrier frequencies used in FM instruments are _____ or _____.
- 17) SNR picks up by pressing BCB along with _____ or _____ button in SL tokenless push button BI .
- 18) Normal implantation of RE mast from centre line of nearest track is _____ meter.
- 19) Insulation resistance of a glued joint in wet condition shall not be
Less than _____ Ohm.
- 20) Only _____ ohms track relay should be used in AC RE area.
- 21) When a signal ahead is blank, the rear signal will display most restrictive aspect.
This aspect in signaling is known as _____.
- 22) Block competency certificate is valid for _____ from date of issue for ESMs.
- 23) Maximum excitation voltage at track relay should not more than _____ % of rated PU voltage for plug in type track relay except QBAT relay.
- 24) One train one operation is achieved by _____ relay.
- 25) _____ Relay shall be used as a 1st repeater relay for QBAT Track Relay.
- 26) The refresher training for all technician staff (Electrical and mechanical) should be given once in _____ year.
- 27) _____ picks up while receiving a train on signals with block instrument in TCF – TOL/TGT – TOL condition.
- 28) When drop shunt test is done with 0.5 ohm resistance the relay voltage should not be more than _____ % of drop away voltage.
- 29) Minimum number of analog channels required to be provided with datalogger system is _____.
- 30) Transmitter coil frequencies in CEL make axle counter is _____ and _____ khz.

III. **Match the following :**

- | | |
|---|---------------------|
| 31. Period of Over hauling for interlocking frames | Once in seven years |
| 32. Period of Over hauling for SGE block instrument | Once in ten years |
| 33. Period of Over hauling for S/L token block instrument | Once in three years |
| 34. Approval for Shifting of signal from LHS to RHS | COM |
| 35. Approval of signaling plan | CSTE |

IV. Choose the best answer.

- 36) Which is the final relay to make ASR to pick in sequential route releasing circuit.
 (A) WLR (B) WCR (C) TSSLR (D) LR
- 37) _____ relay back contact shall be provided across DR back contact to ensure cascading arrangement in 3 aspect signal circuit.
 (A) HE CR (B) DE CR (C) RE CR (D) HR
- 38) A shunt signal can be placed
 (A) On post by itself (B) below any stop signal
 (C) below any stop signal other than first stop signal (D) A & C
- 39) A catch siding shall be provided if the gradient steeper than 1:80 in near vicinity of station and falling
 (A) Away from station (B) towards station
 (C) towards block section (D) all A,B & C.
- 40) IBS exists on
 A) Single line (B) double line
 (C) Multiple line (D) None of the above.
- 41) In double line block working in Non RE area we require
 (A) 2 line wire (B) 3 line wire
 (C) 2 line + separate earth return (D) 3 lines + separate earth return
- 42) If the load current is 4A and back up time required is 10Hrs, then recommended capacity of Lead acid cell is
 (A) 40AH (B) 60AH (C) 80AH (D) 120AH
- 43) Specific gravity of the fully charged lead acid cell is _____ in terms of hydrometer reading
 (A) 1180 (B) 1200₋₅ (C) 1210₋₅ (D) 1240₋₅
- 44) Input voltage of DC - DC converter in IPS
 (A) 24 V DC (B) 110 V DC (C) 24V AC (d) 110 V AC
- 45) In SSDAC of CEL make, Card No.7 is _____
 (A) Modem Card (B) Event Logger Card
 (C) Micro controller logic board (D) Relay Driver Card
- 46) Function of BPAC is to
 (A) verify the complete arrival of train (B) verify the arrival of train
 (C) verify train into block section (D) none of the above
- 47) In SSDAC of CEL make, Card No.6 is _____

- (A) Modem Card (B) Event Logger Card
(C) Micro controller logic board (D) Relay Driver Card

48) When RKT key is locked in condition then _____ contact/s is/are in make condition.
(A) 1 & 2 (B) 3 & 4 (C) 3&5 (D) (A) & (B)

49) Normal working voltage of LED signal unit is/are _____
(A) 110V AC (B) 110VDC (C) 230VAC (D) A & B

50) Speed restriction during time of overhauling of lever frame
(A) 10 kmph (B) 15 kmph (C) 30 kmph (D) 50 kmph

SECTION B

Answer any five Questions (Each carry ten marks)

5 x 10 M = 50 marks

- 1 (a) Write on Importance of Earthing.
(b) Write note on Lightning and Surge Protection Systems used in your Railway.
- 2) Write short notes on any two :- (each carry 5 marks)
(a) SSDAC (b) Back locking
(c) Red lamp protection in signal (d) one train one slot system
- 3) What are the effects of 25 KV RE on signaling system and what safety precautions to be followed by the signal staff working in yard with 25 KV RE.
- 4) Draw point control circuit for IRS type point machine and explain.
- 5) Write the method of Double Line Block working in dispatching a train from station A to B.
- 6) a) Explain the DC double Rail track circuit with the help of wiring diagram.
b) Write the procedure for fail safe adjustment of a DC track circuit.
- 7) a) List out the advantages of Electronic Interlocking over conventional RRI/PI.
b) Write the features of IBS
- 8 (a) What are the hindi examinations conducted by government offices .What is the order of languages in station name board.
(b) Write the Hindi equivalent of the following:
a) Sanctioned
b) Failure
c) Accident
d) Divisional Railway Manager
e) Attendance

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EASTERN RAILWAY
Signal and Telecommunication Branch
Answer to objective Model Question for Instructor (sig)

SECTION A

Answer All Questions (Each carry one mark)

50 x 1 M = 50 marks

I. True or False

- 1) Whenever point set and locked in normal ND & NC contact make. (False)
- 2) Calling On signal can be placed on last stop signal. (False)
- 3) Overlap setting mandatory for calling on signal (False)
- 4) Disconnection for testing of point for obstruction test is not required. (True)
- 5) Catch siding protects block section and slip siding protect station section. (False)
- 6) Shunt signal can be placed below first stop signal. (False)
- 7) Isolation is required for station with standard 1 system of interlocking . (False)
- 8) Amplitude modulation technique is used in digital axle counter to avoid the trolley suppression track circuit. (False)
- 9) When UCR picks up, ASR concerned will be dropped in PI or in RRI. (True)
- 10) Transmitter coils are always connected inside the rail (False)

II. Fill in the blanks

- 11) **3.38.**
- 12) Trolley competency certificate is valid for **three** year.
- 13) Periodicity of foot plate inspection carried out by SSE is **once in three** months..
- 14) Average life of electrical point machine in Suburban section is _____ years.
- 15) Specific gravity of the discharged lead acid cell is **1180** in terms of hydrometer reading.
- 16) Carrier frequencies used in FM instruments are 1800 Hz or 2700 Hz.

- 17) SNR picks up by pressing BCB along with **TGB** or **LCB** button in SL tokenless push button BI .
- 18) Normal implantation of RE mast from centre line of nearest track is _____ meter.
- 19) Insulation resistance of a glued joint in wet condition shall not be
Less than **3000** Ohm.
- 20) Only **9** ohms track relay should be used in AC RE area.
- 21) When a signal ahead is blank, the rear signal will display most restrictive aspect.
This aspect in signaling is known as **red lamp protection**.
- 22) Block competency certificate is valid for **Four** from date of issue for ESMs.
- 23) Maximum excitation voltage at track relay should not more than **300 %** of rated PU voltage for plug in type track relay except QBAT relay.
- 24) One train one operation is achieved by **TSR** relay.
- 25) **QSPA1** Relay shall be used as a 1st repeater relay for QBAT Track Relay.
- 26) The refresher training for all technician staff (Electrical and mechanical) should be given once in **four** year.
- 27) **TAR** picks up while receiving a train on signals with block instrument
in TCF – TOL/TGT – TOL condition.
- 28) When drop shunt test is done with 0.5 ohm resistance the relay voltage should not be more than **85 %** of drop away voltage.
- 29) Minimum number of analog channels required to be provided with datalogger system is **32**.
- 30) Transmitter coil frequencies in CEL make axle counter is **21** and **23** khz.

III. Match the following :

- | | |
|---|---------------------|
| 31. Period of Over hauling for interlocking frames | Once in three years |
| 32. Period of Over hauling for SGE block instrument | Once in seven years |
| 33. Period of Over hauling for S/L token block instrument | Once in ten years |
| 34. Approval for Shifting of signal from LHS to RHS | COM |
| 35. Approval of signaling plan | CSTE |

IV. Choose the best answer.

- 36) Which is the final relay to make **ASR** to pick in sequential route releasing circuit.
(D) LR

- 37) _____ relay back contact shall be provided across DR back contact to ensure cascading arrangement in 3 aspect signal circuit.
(B) DECR
- 38) A shunt signal can be placed
(D) A & C
- 39) A catch siding shall be provided if the gradient steeper than 1:80 in near vicinity of station and falling
(B) towards station
- 40) IBS exists on
(B) double line
- 41) In double line block working in Non RE area we require
(C) 2 line + separate earth return
- 42) If the load current is 4A and back up time required is 10Hrs, then recommended capacity of Lead acid cell is
(A) 40AH
- 43) Specific gravity of the fully charged lead acid cell is _____ in terms of hydrometer reading
(C) 1210_+5
- 44) Input voltage of DC - DC converter in IPS
(B) 110 V DC
- 45) In SSDAC of CEL make, Card No.7 is _____ **(D) Relay Driver Card**
- 46) Function of BPAC is to
(A) verify the complete arrival of train
- 47) In SSDAC of CEL make, Card No.6 is _____
(A) Modem Card
- 48) When RKT key is locked in condition then _____ contact/s is/are in make condition.
(D) (A) & (B)
- 49) Normal working voltage of LED signal unit is/are _____
(D) A & B
- 50) Speed restriction during time of overhauling of lever frame
(B) 15 kmph
