

Booklet Serial No. **11005****DO NOT BREAK THE SEAL OF THE BOOKLET UNTIL YOU ARE TOLD TO DO SO****SERIES : I****QUESTION BOOKLET****Subjects : General English and Electrical Engineering****Full Marks : 300****Time Allowed : 2½ Hours***Read the following instructions carefully before you begin to answer the questions.***INSTRUCTIONS TO CANDIDATES**

1. This Booklet contains **150 questions** to be answered in a separate OMR Answer Sheet using Black Ballpoint Pen in the following two Parts :

Part—A : General English : **50 questions**

Part—B : Electrical Engineering : **100 questions**

2. **All** questions are compulsory.
3. You will be supplied the Answer Sheet separately by the Invigilator. You must complete the details of particulars asked for.
4. Answer must be shown by completely blackening the corresponding circle in the Answer Sheet against the relevant question number by Black Ballpoint Pen. OMR Answer Sheet without marking Series shall not be evaluated.

Example :

Suppose the following question is asked :

The Capital of Meghalaya is

- (A) Guwahati
(B) Kohima
(C) Shillong
(D) Delhi

You will have four alternatives in the Answer Sheet for your response corresponding to each question of the Question Booklet as below :

(A) (B) (C) (D)

In the above illustration, if your chosen response is alternative (C), i.e., Shillong, then the same should be marked on the Answer Sheet by blackening the relevant circle with a Black Ballpoint Pen only as below :

(A) (B) (C) (D)

The example shown above is the only correct method of answering.

5. Answer the questions as quickly and as carefully as you can. Some questions may be difficult and others easy. Do not spend too much time on any one question.
6. There will NOT be any negative marking for wrong answers.
7. The Answer Sheet must be handed over to the Invigilator before you leave the Examination Hall.
8. No Rough Work is to be done on the Answer Sheet. Space for Rough Work has been provided in the Question Booklet.

SEAL

PART—A : GENERAL ENGLISH

(Marks : 100)

Each question carries 2 marks

Directions (Q. Nos. 1-10) :

In these questions, sentences are given with blanks which are to be filled in with appropriate word(s). Four alternatives are suggested for each question. Choose the correct alternative out of the four.

1. My father _____ home last week.
(A) left off
(B) went back
(C) made out
(D) came away
2. He will have to _____ his mistakes.
(A) pay to
(B) pay for
(C) pay off
(D) pay over
3. There are _____ books in the library.
(A) an amount of
(B) a number of
(C) little
(D) much
4. His plans are characterized _____ his boldness.
(A) by (B) with
(C) for (D) of
5. The thieves _____ in a stolen vehicle.
(A) made out
(B) made up
(C) made off
(D) made over
6. By the time I went to the airport yesterday, the plane _____.
(A) will take off
(B) has already taken off
(C) had already take off
(D) had already taken off
7. Your brother is a doctor, _____.
(A) isn't it?
(B) wasn't it?
(C) isn't he?
(D) wasn't he?
8. The teacher, along with the students, _____ on a mission.
(A) was
(B) are
(C) were
(D) having
9. He _____ me yesterday.
(A) strike
(B) stricken
(C) striked
(D) struck
10. My sister _____ many stories.
(A) write
(B) written
(C) has written
(D) writing

Directions (Q. Nos. 11–20) :

In these questions, out of the four alternatives given, choose the one which best expresses the meaning (synonym) of the given word.

11. Hoodlums
(A) criminals (B) workers
(C) scholars (D) fools
12. Sycophant
(A) an expert (B) a leader
(C) a flatterer (D) a guide
13. Aptitude
(A) ignorance
(B) natural ability
(C) disrespect
(D) lack of knowledge
14. Disclosure
(A) concealment (B) hiding
(C) reservation (D) revelation
15. Relinquish
(A) acquire (B) claim
(C) possess (D) renounce
16. Ingenious
(A) clever (B) stupid
(C) evil (D) cunning
17. Levity
(A) seriousness
(B) lightheartedness
(C) loyalty
(D) care

18. Libertine
(A) seducer
(B) freedom fighter
(C) abuser
(D) judge

19. Restitution
(A) restoration (B) rejection
(C) reaction (D) recognition
20. Contempt
(A) admiration (B) adoration
(C) disdain (D) enmity

Directions (Q. Nos. 21–30) :

In these questions, out of the four alternatives given, choose the one which is opposite in meaning (antonym) to the given word.

21. Auspicious
(A) holy
(B) lucky
(C) uninteresting
(D) ominous
22. Exorbitant
(A) expensive (B) precious
(C) useless (D) reasonable
23. Eminent
(A) unknown
(B) well-known
(C) distinguished
(D) careless
24. Credible
(A) foolish (B) trustworthy
(C) unbelievable (D) shocking

25. Sterile

- (A) lively
- (B) plenty
- (C) fertile
- (D) useful

26. Prominent

- (A) prompt
- (B) useful
- (C) fast
- (D) None of the above

27. Amateur

- (A) individual
- (B) collective
- (C) total
- (D) professional

28. Tranquil

- (A) noisy
- (B) calm
- (C) sound
- (D) serious

29. Cajole

- (A) threaten
- (B) flatter
- (C) coax
- (D) persuade

30. Expansion

- (A) increase
- (B) improvement
- (C) production
- (D) contraction

Directions (Q. Nos. 31-40) :

In these questions, four alternatives are given for each idiom/phrase. Choose the alternative which best expresses the meaning of the underlined idiom/phrase.

31. He tried to throw dust in our eyes.

- (A) deceive
- (B) help
- (C) assist
- (D) encourage

32. We should provide for a rainy day.

- (A) spend extravagantly
- (B) save money in the bank
- (C) borrow money
- (D) save money for future emergencies

33. I avoid him because he always rides the high horse.

- (A) is cunning
- (B) is cruel
- (C) acts arrogant
- (D) is mad

34. I threatened to show her up.

- (A) ignore her completely
- (B) expose her shortcomings
- (C) praise her publicly
- (D) help her succeed

35. He scraped through the examination.

- (A) barely passed
- (B) failed
- (C) passed with high marks
- (D) repeated

36. The enemy turned tail.

- (A) charged forward
- (B) attacked
- (C) retreated shamefully
- (D) took out a weapon

37. Can you throw any light on the mystery?

- (A) give the plan
- (B) give documents
- (C) give time
- (D) give information

38. He will weather the storm.

- (A) discuss the matter
- (B) close the matter
- (C) take responsibility
- (D) overcome the difficulties

39. I will hang on to these pictures.

- (A) throw away
- (B) discard
- (C) store carefully
- (D) put up

40. I wish you would support me and not let me down.

- (A) help me quietly
- (B) fail to help me
- (C) help me out
- (D) suffer

Directions (Q. Nos. 41-50) :

In these questions, match the collective noun with the correct option.

41. A pack of

- (A) cats
- (B) sparrows
- (C) wolves
- (D) snakes

42. A fleet of

- (A) clothes
- (B) books
- (C) ships
- (D) jewellery

43. A pride of

- (A) crows
- (B) owls
- (C) dogs
- (D) lions

44. A choir of

- (A) dancers
- (B) performers
- (C) ballerinas
- (D) singers

45. A flock of

- (A) girls
- (B) ladies
- (C) birds
- (D) insects

46. A catalogue of

- (A) prices
- (B) diaries
- (C) meanings
- (D) materials

47. A heap of

- (A) milk
- (B) juice
- (C) ideas
- (D) rubbish

48. A chest of

- (A) cupboards
- (B) shelves
- (C) drawers
- (D) tables

49. A bundle of

- (A) animals
- (B) people
- (C) dust
- (D) sticks

50. A hail of

- (A) angels
- (B) bullets
- (C) savages
- (D) gypsies

PART—B : ELECTRICAL ENGINEERING

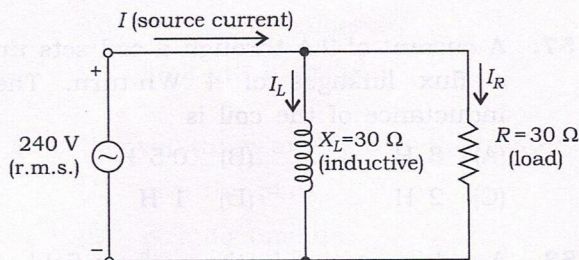
(Marks : 200)

Each question carries 2 marks

51. The purpose of load in an electric circuit is to
(A) increase the circuit current
(B) utilize electrical energy
(C) decrease the circuit current
(D) None of the above
52. Kirchhoff's current law at a junction deals with
(A) conservation of energy
(B) conservation of momentum
(C) conservation of angular momentum
(D) conservation of charge
53. A Wheatstone bridge is balanced. If the galvanometer is short circuited, the currents in the various resistors will
(A) increase
(B) decrease
(C) not change
(D) Cannot say
54. Norton's theorem is _____ form of an equivalent circuit.
(A) both voltage and current
(B) current
(C) voltage
(D) None of the above
55. In order to increase the capacitance of a parallel-plate capacitor, one should introduce between the plates a sheet of
(A) mica
(B) tin
(C) copper
(D) stainless steel
56. Out of the following materials, the area of hysteresis loop will be least for
(A) wrought iron
(B) hard steel
(C) silicon steel
(D) soft iron
57. A current of 2 A through a coil sets up a flux linkages of 4 Wb-turn. The inductance of the coil is
(A) 8 H (B) 0.5 H
(C) 2 H (D) 1 H
58. A coil is rotating in the uniform field of an 8-pole generator. In one revolution of the coil, the number of cycles generated by the voltage is
(A) one (B) four
(C) two (D) eight
59. The peak factor of a sine waveform is
(A) 1.11 (B) 1.414
(C) 2 (D) 1.5
60. At parallel resonance
(A) circuit impedance is minimum
(B) power factor is zero
(C) line current is maximum
(D) power factor is unity
61. In a power triangle for load, P represents active power, Q represents reactive power and S represents apparent power. Then magnitude of load power factor is
(A) P/S (B) S/P
(C) $P/(S^2+P^2)$ (D) $P/(Q+S)$

62. Domestic appliances are connected in parallel across AC mains because
- it is a simple arrangement
 - operation of each appliance becomes independent of the other
 - appliances occupy less space
 - appliances have same current ratings

63. The power taken by the circuit as shown in the figure below is



- 480 W
 - 1920 W
 - 120 W
 - None of the above
64. The active component of line current shown in the figure of Q. No. 63 is
- 8 A
 - 4 A
 - 5.3 A
 - None of the above
65. The power factor of the circuit shown in the figure of Q. No. 63 is
- 0.707 lagging
 - 0.5 lagging
 - 0.866 lagging
 - None of the above
66. In a three-phase circuit, if load p.f. is decreased, the line current
- decreases
 - increases
 - remains the same
 - Data insufficient

67. Three equal impedances are first connected in delta across three-phase balanced supply. If same impedances are connected in star across the same supply

- phase current will be $1/3$ of the previous value
- line current will be $1/3$ of the previous value
- power consumed will be $1/3$ of the previous value
- power consumed will be 3 times the previous value

68. The scale of a permanent-magnet moving-coil instrument is uniform because

- of effective eddy current damping
- external magnetic fields have no effect
- it is spring controlled
- it has no hysteresis loss

69. For the measurement of high direct voltage about 10 kV, one would use _____ voltmeter.

- permanent-magnet moving-coil
- electrostatic
- hot-wire
- moving-iron

70. On a simple ohmmeter, the 0Ω mark is _____ of the scale.

- far left
- far right
- in the middle
- None of the above

71. Out of the following, the most accurate measurement of unknown resistance will be obtained by

- potentiometer
- ohmmeter
- voltmeter and ammeter
- Wheatstone bridge

72. Induction wattmeter can measure

- (A) AC power only
- (B) DC power only
- (C) both AC and DC powers
- (D) None of the above

73. A 4-pole, lap-wound DC shunt generator has an armature winding consisting of 220 turns each of 0.004Ω . The armature resistance is

- (A) 0.5Ω
- (B) 1Ω
- (C) 0.025Ω
- (D) 0.055Ω

74. In arc welding, in order to obtain steady arc, one should use

- (A) DC series
- (B) DC shunt generator
- (C) DC differentially compounded generator
- (D) DC cumulatively compounded generator

75. A simple method of increasing the voltage of a DC generator is

- (A) to decrease the air gap flux density
- (B) to increase the speed of rotation
- (C) to decrease the speed of rotation
- (D) to increase the length of the armature

76. Identify the important feature of a DC series motor.

- (A) High starting torque
- (B) Medium starting torque
- (C) Zero starting torque
- (D) Low starting torque

77. The mutual flux in a transformer remains constant at all loads because

- (A) applied voltage and frequency are constant
- (B) leakage flux is small
- (C) iron core is used
- (D) losses are small

78. A transformer takes a current of 0.6 A and absorbs 64 W when the primary is connected to its normal supply of 200 V , 50 Hz , the secondary being on open circuit. The iron loss current is

- (A) 0.2 A
- (B) 0.43 A
- (C) 1 A
- (D) 0.32 A

79. Leakage flux in a transformer occurs because

- (A) iron core has high permeability
- (B) air is not a good magnetic insulator
- (C) applied voltage is sinusoidal
- (D) transformer is not an efficient device

80. Transformers having ratings less than 5 kVA are generally

- (A) oil cooled
- (B) natural air cooled
- (C) water cooled
- (D) None of the above

81. Short-circuit test of a transformer helps us to find its

- (A) iron loss
- (B) full-load Cu loss
- (C) Cu loss at no load
- (D) None of the above

82. The autotransformer is preferably employed in a situation where voltage transformation ratio (K) is

- (A) very low
- (B) very high
- (C) near unity
- (D) unity

83. If the frequency of three-phase supply to the stator of a three-phase induction motor is increased, then synchronous speed

- (A) is decreased
- (B) is increased
- (C) remains unchanged
- (D) None of the above

84. A 4-pole, 50 Hz induction motor operates at 5% slip. The frequency of e.m.f. induced in the rotor will be
 (A) 25 Hz
 (B) 50 Hz
 (C) 2.5 Hz
 (D) None of the above
85. The efficiency of a transformer will be maximum when
 (A) leakage reactance of the two windings are equal
 (B) resistances of the two windings are equal
 (C) copper loss is equal to constant loss
 (D) None of the above
86. The power input to the rotor of 440 V, 50 Hz, 6-pole, three-phase induction motor is 80 kW. The rotor e.m.f. is observed to make 100 complete cycles per minute. What is the slip?
 (A) 2.5% (B) 3.3%
 (C) 1.5% (D) 4.8%
87. The rotor of induction motor
 (A) always revolves in the direction of stator flux
 (B) always revolves in the direction opposite to stator flux
 (C) Both of the above
 (D) None of the above
88. A 208 V, 10 hp, 4-pole, 60 Hz, Y-connected induction motor has a full-load slip of 5%. The shaft torque of the motor at rated load is
 (A) 30.6 N-m (B) 52.7 N-m
 (C) 28.7 N-m (D) 41.7 N-m
89. In three-phase induction motor, the initial inrush of current
 (A) produces large line voltage drop
 (B) produces large phase voltage drop
 (C) damages the rotor windings
 (D) produces high starting torque
90. A resistance split-phase induction motor is used for
 (A) low inertia loads
 (B) high inertia loads
 (C) very high inertia loads
 (D) None of the above
91. A capacitor-start, capacitor-run motor has
 (A) low power factor
 (B) high power factor
 (C) low efficiency
 (D) high starting torque
92. A 4-pole, 50 Hz, single-phase induction motor is running with a slip of 3.4%. The speed of the motor is
 (A) 1279 r.p.m. (B) 1120 r.p.m.
 (C) 1449 r.p.m. (D) 1540 r.p.m.
93. The purpose of skewing of rotor slots in induction motor is
 (A) to reduce the magnetic hum of the motor
 (B) to increase the distribution factor
 (C) to reduce the locking tendency of rotor
 (D) to increase the breadth factor
94. The rating of the prime mover driving an alternator is determined entirely by its _____ rating.
 (A) voltage (B) current
 (C) kW output (D) speed

95. If the voltage of one of the two alternators operating in parallel suddenly falls, then
 (A) both machines will stop
 (B) synchronous torque will come into operation to restore synchronism
 (C) alternator whose voltage suddenly decreases will stop
 (D) both alternators will stop
96. If the field of a synchronous motor is under-excited, the power factor will be
 (A) lagging (B) leading
 (C) unity (D) zero
97. A power station has a maximum demand of 15000 kW. The annual load factor is 50% and the plant capacity factor is 40%. What is the plant capacity?
 (A) 30000 kW (B) 175000 kW
 (C) 18750 kW (D) 15250 kW
98. Major share of power generated in India is through
 (A) hydroelectric plant
 (B) nuclear power plant
 (C) gas turbine plant
 (D) thermal power plant
99. How is the most economical voltage selected for transmission in a particular requirement?
 (A) Based on Fleming's left-hand rule
 (B) Based on Kelvin's law
 (C) Based on Fleming's right-hand rule
 (D) Based on Lenz's law
100. The most economical limit of power factor is governed by
 (A) original power factor
 (B) relative cost of supply and p.f. correction equipment
 (C) Both (A) and (B)
 (D) None of the above
101. If voltage is increased by n times, the size of the conductor would be
 (A) increased by n times
 (B) reduced by $1/n$ times
 (C) increased by n^2 times
 (D) reduced by $1/n^2$ times
102. The dielectric strength of air under normal conditions is
 (A) 30 kV/cm (B) 100 kV/cm
 (C) 150 kV/cm (D) 200 kV/cm
103. The main consideration in designing distributor is
 (A) transmission voltage
 (B) resistance
 (C) voltage drop
 (D) current carrying capacity
104. Suspension type insulators are used for voltages beyond
 (A) 400 kV (B) 11 kV
 (C) 33 kV (D) 800 kV
105. If shunt capacitance in a string of suspension insulators is decreased, then string efficiency
 (A) remains the same
 (B) decreases
 (C) increases
 (D) None of the above

- 106.** In a 33 kV overhead line, there are 3 units in the string of insulators. The voltage across the string is
 (A) 33 kV (B) 11 kV
 (C) 22 kV (D) 19.05 kV
- 107.** Corona effect can be reduced by
 (A) increasing the conductor size
 (B) decreasing the conductor size
 (C) decreasing the conductor spacing
 (D) None of the above
- 108.** The negative voltage regulation of transmission line means
 (A) $V_R = V_S$
 (B) $V_R < V_S$
 (C) $V_R > V_S$
 (D) None of the above
- 109.** The insulators may fail due to
 (A) flashover
 (B) short circuits
 (C) deposition of dust
 (D) Any of the above
- 110.** The string efficiency of a high voltage AC transmission line is about
 (A) 80% (B) 100%
 (C) 40% (D) 10%
- 111.** The line which connects distributor to substation is called
 (A) service main
 (B) distributor
 (C) feeder
 (D) None of the above
- 112.** In AC motors, the magnetizing current
 (A) lags the voltage by 90°
 (B) leads the voltage by 90°
 (C) is in phase with voltage
 (D) None of the above
- 113.** For operating voltages beyond 66 kV, the cables used are
 (A) belted type
 (B) SL type
 (C) oil-filled
 (D) None of the above
- 114.** The radial system of power distribution is used for
 (A) short distances only
 (B) long distances only
 (C) both short and long distances
 (D) None of the above
- 115.** In cables, electrostatic stress is
 (A) maximum at conductor surface
 (B) minimum at conductor surface
 (C) maximum at the sheath
 (D) same at the conductor and sheath
- 116.** A booster is
 (A) DC shunt generator
 (B) DC compound generator
 (C) DC series generator
 (D) None of the above
- 117.** A 1000 kVA transformer has a reactance of 5%. Its reactance at 2000 kVA base is
 (A) 5% (B) 2.5%
 (C) 20% (D) 10%

118. Reactors are connected _____ with the system.

- (A) in series
- (B) in parallel
- (C) in series-parallel
- (D) None of the above

119. In a three-phase, 4-wire unbalanced system, the current in the neutral wire is 18 A. The magnitude of zero sequence current is

- (A) 18 A (B) 9 A
- (C) 6 A (D) 3 A

120. Which portion of the power system is least prone to faults?

- (A) Switchgear (B) Transformer
- (C) Alternator (D) Overhead line

121. Under normal operating conditions, the contacts of the circuit breaker remain

- (A) closed
- (B) open
- (C) semi-closed
- (D) None of the above

122. Current chopping mainly occurs in

- (A) air blast circuit breaker
- (B) vacuum circuit breaker
- (C) oil circuit breaker
- (D) SF6 circuit breaker

123. The relay operating coil is supplied through

- (A) fuse
- (B) current transformer
- (C) power transformer
- (D) None of the above

124. The fusing factor is

- (A) always 1
- (B) always more than 1
- (C) always less than 1
- (D) None of the above

125. The transient voltage that appears across the contacts of the circuit breaker at the instant of arc extinction is known as

- (A) restriking voltage
- (B) recovery voltage
- (C) breaking voltage
- (D) supply voltage

126. Resonance in the power system occurs when the inductive reactance of the circuit is _____ capacitive reactance of the circuit.

- (A) greater than
- (B) smaller than
- (C) equal to
- (D) None of the above

127. Merz-Price protection is employed for the protection of

- (A) alternators
- (B) transformers
- (C) Both (A) and (B)
- (D) None of the above

128. By burden of relay, we generally mean

- (A) current rating of relay
- (B) volt-ampere rating of relay
- (C) voltage rating of relay
- (D) watt rating of relay

- 129.** The protection against direct lightning strokes and high voltage steep waves is provided by
- ground wires
 - lightning arrestors
 - Both (A) and (B)
 - None of the above
- 130.** Zero condition for a system means
- input reference signal is zero
 - zero stored energy
 - system is at rest and no energy is stored in any of its components
 - None of the above
- 131.** In a control system, the output of the controller is given to
- final control element
 - amplifiers
 - comparator
 - None of the above
- 132.** Asymptotic stability is concerned with
- a system under influence of input
 - a system not under influence of input
 - a system under influence of output
 - None of the above
- 133.** Routh-Hurwitz criterion gives
- the number of roots in the right half of the s -plane
 - the value of the roots
 - the number of roots in the left half of the s -plane
 - None of the above
- 134.** The polar plot of a transfer function passes through the critical point $(-1, 0)$. The gain margin is
- zero
 - -1 dB
 - 1 dB
 - None of the above
- 135.** If the gain of the open-loop system is doubled, the gain margin
- is not affected
 - gets doubled
 - becomes half
 - becomes one-fourth
- 136.** The resistivity of a semiconductor depends upon its
- shape
 - length
 - Both (A) and (B)
 - atomic structure
- 137.** The maximum rectification efficiency of a half-wave rectifier is
- | | |
|--------------|--------------|
| (A) 81.2% | (B) 40.6% |
| (C) 50% | (D) 25% |
- 138.** The primary function of a centre-tapped transformer in a power supply is to
- step up the voltage
 - step down the voltage
 - cause the diodes to conduct alternately
 - None of the above
- 139.** For full-wave rectifier, the minimum number of diodes required is
- | | |
|-------|-------|
| (A) 1 | (B) 2 |
| (C) 3 | (D) 4 |

- 140.** The negative current feedback in an amplifier _____ of the amplifier.
 (A) increases voltage gain
 (B) reduces voltage gain
 (C) increases power gain
 (D) None of the above
- 141.** An oscillator produces _____ oscillations.
 (A) damped
 (B) undamped
 (C) modulated
 (D) None of the above
- 142.** A Wien bridge oscillator uses _____ feedback.
 (A) only positive
 (B) only negative
 (C) both positive and negative
 (D) None of the above
- 143.** A Colpitts oscillator uses _____ voltage divider in the feedback circuit.
 (A) resistive
 (B) inductive
 (C) capacitive
 (D) None of the above
- 144.** The expression for absorption law is given by
 (A) $A+AB=A$ (B) $A+AB=B$
 (C) $AB+AA=A$ (D) $A+B=B+A$
- 145.** The logic circuits whose output at any instant of time depends not only on the present input but also on the past output are called
 (A) combinational circuits
 (B) sequential circuits
 (C) latches
 (D) flip-flops
- 146.** For an SCR in the forward blocking mode (practically)
 (A) leakage current does not flow
 (B) leakage current flows from anode to cathode
 (C) leakage current flows from cathode to anode
 (D) None of the above
- 147.** Higher the magnitude of the gate pulse
 (A) lesser is the time required to inject the charges
 (B) greater is the time required to inject the charges
 (C) greater is the value of anode current
 (D) None of the above
- 148.** Choppers convert
 (A) AC to DC
 (B) DC to AC
 (C) DC to DC
 (D) None of the above
- 149.** AC voltage controller converts
 (A) fixed AC to fixed DC
 (B) variable AC to variable DC
 (C) fixed AC to variable AC
 (D) None of the above
- 150.** Pulse gating is suitable for
 (A) R loads only
 (B) R and RL loads
 (C) RL loads only
 (D) None of the above