

650TN(EL)

QUESTION  
BOOKLET CODE

A



Government of India  
Department of Space  
**LIQUID PROPULSION SYSTEMS CENTRE**  
Valiamala PO, Thiruvananthapuram - 695 547

**WRITTEN TEST FOR SELECTION TO THE POST OF  
TECHNICIAN 'B' (ELECTRICIAN)**

Date: 30.10.2016

Maximum Marks: 300

Time: 2 hours

Name of the Candidate:

Roll No.:

**Instructions to the Candidates**

1. Candidates should read carefully the instructions in the Question booklet and OMR Answer Sheet before start answering.
2. You have been called for the written test based on the data furnished by you in the on-line application. If you have wrongly entered in the application or you do not possess the required qualification as per our advertisement, your candidature will be rejected.
3. You should sign the Admit Card/Photograph only in the presence of the invigilator in the Examination Hall.
4. The question paper is in the form of Question Booklet with 75 questions. A separate OMR sheet is provided for answering the Questions.
5. **Question Booklet series code (A/B/C/D/E) printed on the right hand top corner should be written in the OMR answer sheet in the place provided.**
6. Enter your Name and Roll Number in the Question Booklet.
7. All entries in the OMR answer sheet should be with blue/black ball point pen only.

P.T.O

8. The written test will be of objective type based on the qualification prescribed for the post with four answers indicated, of which only one will be unambiguously correct.
  9. You have to select the right answer by marking the corresponding oval on the OMR answer sheet by blue/black ball point pen as per the instructions given in the OMR answer sheet.
  10. All questions carry **four** marks each, **zero** marks for no answer and **one negative** mark for a wrong answer.
  11. Multiple answers for a question will be regarded as a wrong answer.
  12. Marking in OMR may be done with utmost care. No spare OMR sheet will be provided.
  13. Computers, Calculators, mobile phones, reference books, logarithm table, electronic gadgets etc. will not be allowed inside the Examination Hall.
  14. Space available in the Question Booklet can be used for rough work.
  15. **On completion of the test, tear the OMR answer sheet along the perforation mark at the top and hand over the original OMR answer sheet to the invigilator and retain the duplicate copy with you.**
  16. Candidates are not permitted to leave the Examination Hall during the first one and a half hour of the examination.
  17. Candidates leaving the examination hall after 1150 hrs will be allowed to retain the Question Booklet.
  18. After the Examination, candidates should hand over OMR Answer Sheet and Admit Card to the Invigilator.
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TECHNICIAN 'B' ( ELECTRICIAN)

1. Non-Conductor or insulators with increase in temperature:
  - a) Usually increase in Resistance
  - b) Usually decrease in Resistance
  - c) No effect on the temperature
  - d) Some time increase and sometime decrease
  
2. Conductance depends the reciprocal of
  - a) Only on Length
  - b) Only of resistivity
  - c) Only on the area of cross section
  - d) On all the above three
  
3. Absolute permittivity of vacuum is taken as
  - a)  $8.854 \times 10^{-12}$  Farad/m
  - b)  $8.854 \times 10^{-9}$  Farad/m
  - c)  $8.854 \times 10^{-6}$  Farad/m
  - d)  $8.854 \times 10^{-3}$  Farad/m
  
4. Dielectric Strength of a medium is usually expressed in
  - a) kV/mm
  - b) Coulomb/sq.m
  - c) Newtons/mm
  - d) Joules/sq.m
  
5. One Volt is same as
  - a) One Coulomb
  - b) One Joule
  - c) One Joule/Coulomb
  - d) One Coulomb/joule
  
6. Hysteresis loss least depends on
  - a) Magnetic Field intensity
  - b) Frequency
  - c) Ambient temperature
  - d) Volume of material
  
7. The magnitude of induced e.m.f is directly proportional to the
  - a) Rate of change of current
  - b) Rate of change of flux linkage
  - c) Constant value of current
  - d) Resistance
  
8. In DC generators, current to external circuit from armature is given through
  - a) Slip rings
  - b) Commutator
  - c) Solid Connections
  - d) Armature winding
  
9. Which DC motor will be preferred for machine tools.
  - a) Series motor
  - b) Shunt motor
  - c) Differentially Compounded motor
  - d) Cumulatively compounded motor.
  
10. Which motor has poorest speed control
  - a) Series motor
  - b) Shunt motor
  - c) Differentially Compounded motor
  - d) Cumulatively compounded motor

11. A 4pole DC generator rotates at 1500 rpm. How many times in a second, will the emf induced in each armature conductor changes its direction.
- a) 50                      b) 100                      c) 200                      d) 400
12. Which of the following wave has the highest value of peak factor.
- a) Sine wave                      b) Square wave  
c) Triangular wave                      d) Half wave rectified sine wave
13. The time period for the frequency of 1 MHZ is
- a) 0.01 second    b) 1 milli second    c) 1 micro second    d) 1 pico second
14. The voltage of domestic supply is 220V, this figure represents.
- a) Peak value    b) RMS value    c) Average value    d) Mean value
15. A coil induces 200mV when the current changes at the rate of one ampere per second. The value of inductance is
- a) 2000mH    b) 200mH    c) 20mH    d) 2mH
16. Which of the following materials has the highest value of dielectric constant
- a) Oil                      b) Glass                      c) Vacuum                      d) Ceramics
17. The power dissipated in a pure capacitor is
- a) Proportional to applied voltage                      b) Proportional to value of capacitance  
c) Both (a) and (b)                      d) Zero
18. A practical method to improve the lagging power factor of a fluorescent lamp is to
- a) Increase the voltage across the lamp  
b) Connect a capacitor across the starter  
c) Connect a capacitor across the lamp circuit  
d) Connect a capacitor series with ballast
19. When two wattmeters are used to measure power a 3 phase balance circuit and one wattmeter reads negative, it means the angle of lag is
- a)  $0^\circ$                       b)  $30^\circ$                       c)  $45^\circ$                       d) above  $60^\circ$
20. If in two-phase supply there is 200V supply between phase and neutral, what will be the supply voltage between phase to phase.
- a) 200V                      b)  $200 \times \sqrt{2}$  V                      c)  $200 \times \sqrt{3}$  V                      d) 100V
21. By adding more resistance to a R-L circuit the angle of phase difference will be
- a) increase                      b) decrease                      c) no change                      d) zero

22. An Auto transformer working in the principle of  
a) Mutual Induction      b) Self Induction      c) Heating      d) Split phase
23. The 'hum' in a transformer is produced due to  
a) Eddy currents      b) Load variations  
c) Magnetic forces      d) Lightning
24. Which of the following statement is false  
a) For the same KVA rating an auto transformer has higher efficiency  
b) Oil in transformer serves the purpose of cooling as well as insulation  
c) A transformer is always free from windage losses  
d) None of the above
25. Buchholz relay works on the principle of  
a) Loss of dielectric strength of transformer oil due to presence of moisture  
b) Magnetostriction in core causing violent vibration  
c) Violent gas generation before transformer break down  
d) Smoke generated by Burning of insulation materials
26. The full load copper loss of a transformer is 1600watts. At half load, the copper loss will be  
a) 600W      b) 6400W      c) 800W      d) 400W
27. Clip on ammeter as  
a) High voltage ration transformer      b) Step up transformer  
c) Potential transformer      d) Current transformer
28. The magnetic coupling between primary and secondary sides of a transformer can be improved by  
a) Using winding materials of low resistivity  
b) Using insulation of better quality between the windings  
c) Using the magnetic core of low reluctance  
d) Using oil of high dielectric strength.
29. Which of the following is not an essential condition for running two transformer in parallel  
a) Same polarity      b) Same KVA rating  
c) Same voltage ratio      d) Same percentage impedance
30. Heating value of coal is around  
a) 1000 kcal/kg      b) 2000kcal/kg      c) 6000 kcal/kg      d) 10000 kcal/kg
31. In a nuclear power plant which of the following is used to slow down the fast neutrans?  
a) Reflector      b) Shield      c) Control rod      d) Moderator

32. Diesel Engines are supercharged

- a) To increase air-fuel ratio
- b) To reduce combustion temperature
- c) To improve heat transfer
- d) To increase specific power output.

33. A synchronous condenser is generally installed at the

- a) Sending end of the transmission line
- b) Receiving end of the transmission line
- c) Middle of the transmission line
- d) Point of least resistance along the transmission line.

34. Choose the correct Order of the cable construction from inner to outer.

- i) Conductor
  - ii) Sheathing
  - iii) Armouring
  - iv) Insulation
- a) i, ii, iii, iv
  - b) i, iv, ii, iii
  - c) i, iv, iii, ii
  - d) iv, iii, ii, i

35. An isolator is installed

- a) As a substitute for circuit breaker
- b) Always independent of the position of circuit breaker
- c) Generally on both sides of circuit breaker
- d) To operate the relay of circuit breaker

36. For a given size of motor, the fuse rating of a induction motor depends

- a) Power factor
- b) Method of installation
- c) Method of starting
- d) Speed of motor

37. A circuit breaker can be operated

- a) Manually
- b) Automatically
- c) By remote control
- d) All the above

38. Match the following voltage with suitable circuit breakers

**A**

- 1) 440V
- 2) 11000V
- 3) 66000V
- 4) 132000V

**B**

- A) SF6 BREAKER
- B) ACB
- C) Air blast Circuit breaker
- D) VCB

- a) 1 - C, 2 - B, 3 - D, 4 - A
- b) 1 - B, 2 - D, 3 - A, 4 - C
- c) 1 - D, 2 - C, 3 - B, 4 - A
- d) 1 - D, 2 - B, 3 - A, 4 - C

39. Which of the following motor has series characteristics
- a) Repulsion motor
  - b) Shaded pole motor
  - c) Capacitor start motor
  - d) None of the above
40. The luminous flux received by a surface per unit area is called
- a) Candle power
  - b) Illumination
  - c) CRI
  - d) Brightness co-efficient
41. Increase in voltage for a GLS lamp reduces
- a) Efficiency
  - b) Wattage
  - c) Light output
  - d) Life
42. In electric discharge lamps, bluish white colour is given by
- a) High pressure Sodium vapour
  - b) Mercury vapour at high pressure
  - c) Mercury vapour at low pressure
  - d) Chlorine gas
43. An alternator having 8 poles rotating 250rpm will have frequency of voltage generated as
- a) 60 Hz
  - b) 50Hz
  - c) 25Hz
  - d) 16 2/3 Hz
44. The speed of an alternator is changed from 3000 rpm to 1500 rpm. The generated emf/ phase will become
- a) Double
  - b) Unchanged
  - c) Half
  - d) One fourth
45. In alternator negative regulation can be expected in case of
- a) Slow speed alternators
  - b) High speed alternators
  - c) Leading power factor load
  - d) Lagging power factor load
46. A synchronous motor is better power factor as compared to that of an equivalent induction motor. This is mainly because.
- a) Synchronous motor has no slip
  - b) Stator supply is not required to produce magnetic field
  - c) Load on the rotor remains constant
  - d) Has large air gap
47. A four pole, 50Hz, 440V, 3 phase induction motor with 3% slip will run on
- a) 1550 rpm
  - b) 1500 rpm
  - c) 1495 rpm
  - d) 1455 rpm
48. The speed of a squirrel cage induction motor can be controlled by all of the following methods except
- a) Reducing supply voltage
  - b) Changing rotor winding resistance
  - c) Changing no of poles
  - d) Changing supply frequency

49. Various methods for starting an induction motor are listed below. Which method requires six-stator terminals?

- a) Rotor rheostat
- b) Auto transformer
- c) Star delta
- d) DOL

50. A 3 phase, 400V, 60Hz, 960 rpm induction motor is run on 50Hz . The motor will

- a) Burnout
- b) Run at 960 rpm.
- c) Run at more than 960 rpm
- d) Run at less than 960 rpm

51. Which of the following is class C insulation

- a) Teflon
- b) Mica
- c) Paper
- d) Cloth

52. In a three phase induction motor

- a) Power factor at starting is the same as that while running
- b) Power factor at starting is low compared to that while running
- c) Power factor at starting is high compared to that while running
- d) None of the above

53. The low power factor of induction motor is due to

- a) Magnetizing current necessary to generate the magnetic flux
- b) Stator reactance
- c) Rotor leakage reactance
- d) All of the above

54. A shaded pole single phase motor is generally not used due to all of the following reasons except

- a) Poor starting torque
- b) Low power factor
- c) Low speed operation
- d) Irreversibility of direction of rotation.

55. Motorized hand tools generally use

- a) Capacitor start motors
- b) Reluctance motors
- c) Shaded pole motors
- d) Universal motors.

56. A single phase motor is usually started by.

- a) Direct on line starter
- b) Star delta starter
- c) Auto transformer starter
- d) None of the above



57. In shaded pole motors, the necessary phase splitting is produced by

- a) Induction
- b) Capacitance
- c) Resistance
- d) Inductance

58. In repulsion motors

- a) Speed remains constant
- b) Speed variation is within 5%
- c) Speed varies with load
- d) Speed varies only with change in applied voltage.

59. Which of the following is unexcited single phase synchronous motor?

- a) Reluctance motor
- b) Universal motor
- c) AC series motor
- d) Repulsion motor

60. A semi conductor diode used as a rectifier must be operated

- a) In the non-linear region
- b) In the linear region
- c) In the cut-off region
- d) None of the above

61. In an intrinsic semiconductor the Fermi level is

- a) Exactly at the middle of the energy gap
- b) Near the edge of conduction band
- c) Near the edge of valance band
- d) At the surface of the semiconductor

62. Which of the electrical instruments have to be connected in the same manner for measurement

- a) Frequency meter and P.F meter
- b) Voltmeter and Frequency meter
- c) Voltmeter and P.F meter
- d) Wattmeter and Voltmeter.

63. A Motor has 36 slots, 36 coil, 4pole winding 3 phase the number of coils per groups.

- a) 12
- b) 3
- c) 4
- d) 1

64. How much apart are the two ends of a coil connected in a simplex wave winding of a 4 pole DC generator.

- a)  $90^\circ$
- b)  $120^\circ$
- c)  $180^\circ$
- d)  $360^\circ$

65. Choose the correct matching of Group A & B

**A**

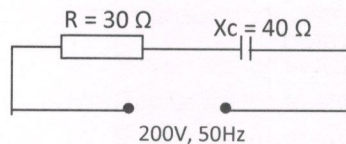
- 1) Porcelain
- 2) Copper
- 3) Transformer Oil
- 4) Silicon

**B**

- A) Conductor
- B) Cooling medium
- C) Semi-conductor
- D) Insulator

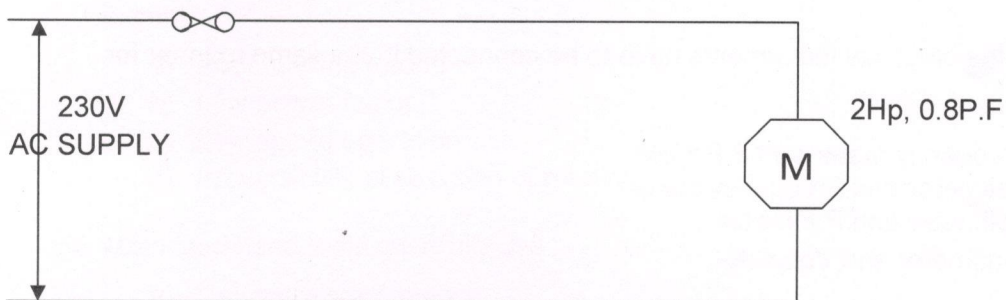
- a) 1 - B, 2 - A, 3 - C, 4 - D
- b) 1 - D, 2 - A, 3 - B, 4 - C
- c) 1 - D, 2 - B, 3 - C, 4 - A
- d) 1 - B, 2 - A, 3 - D, 4 - C

66. Find out impedance and apparent power of given RC circuit.



- a)  $50 \Omega$ , 800 VA
- b)  $50 \Omega$ , 800 W
- c)  $50 \Omega$ , 400 VA
- d)  $70 \Omega$ , 480 VA

67. Find the current flow in the circuit.



- a) 8A
- b) 0.1A
- c) 1A
- d) 6.4A

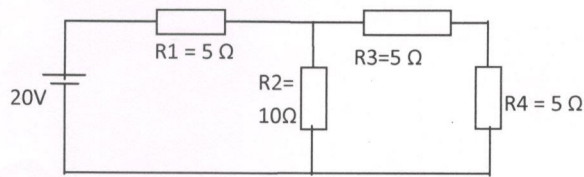
68. The Energy meter is..

- a) indicating instrument
- b) recording instrument
- c) integrating instrument
- d) none of the above

**A**

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69. Find out the effective resistance of the circuit?



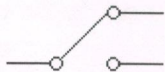
- a)  $5\ \Omega$       b)  $25\ \Omega$       c)  $10\ \Omega$       d)  $1\ \Omega$

70. Choose the right answers

1. Solar PV cells generate the power by solar heat Energy.
2. Solar PV cells generate the power by solar radiation.
3. Solar PV cells are made by semiconductors.
4. Solar PV cells produce AC voltage.

- a) 1 & 2      b) 2 & 3      c) 3 & 4      d) 1, 2 & 4

71. What type of switch is this?



- a) 2 Bush buttons      b) SPST      c) DPDT      d) SPDT

72. Which of the following devices does not have negative resistance characteristics

- a) FET      b) SCR      c) UJT      d) None of the above

73. In a two pole DC generator having duplex lap winding the number of armature parallel path is

- a) 2      b) 4      c) 8      d) 12

74. Which of the following meters has the best accuracy?

- a) Moving iron meter      b) Moving coil meter  
c) Rectifier type meter      d) Thermocouple meter

75. Two batteries each of open circuit voltage 2V and internal resistance  $2\ \Omega$  are connected in parallel to supply a load  $2\ \Omega$ . The current supplied by each battery is

- a) 0.33A      b) 2A      c) 0.8A      d) 1A

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Space for rough work