144/2017

Question Booklet Alpha Code: **A**

Question Booklet Serial Number: **166081**

Total No. of questions : 100

Time : 75 Minutes

Maximum : 100 Marks

INSTRUCTIONS TO CANDIDATES

1. The question paper will be given in the form of a Question Booklet. There will be four versions of question booklets with question booklet alpha code viz. A, B, C & D.
2. The Question Booklet Alpha Code will be printed on the top left margin of the facing sheet of the question booklet.
3. The Question Booklet Alpha Code allotted to you will be noted in your seating position in the Examination Hall.
4. If you get a question booklet where the alpha code does not match to the allotted alpha code in the seating position, please draw the attention of the Invigilator IMMEDIATELY.
5. The Question Booklet Serial Number is printed on the top right margin of the facing sheet. If your question booklet is un-numbered, please get it replaced by new question booklet with same alpha code.
6. The question booklet will be sealed at the middle of the right margin. Candidate should not open the question booklet, until the indication is given to start answering.
7. Immediately after the commencement of the examination, the candidate should check that the question booklet supplied to him contains all the 100 questions in serial order. The question booklet does not have unprinted or torn or missing pages and if so he/she should bring it to the notice of the Invigilator and get it replaced by a complete booklet with same alpha code. This is most important.
8. A blank sheet of paper is attached to the question booklet. This may be used for rough work.
9. **Please read carefully all the instructions on the reverse of the Answer Sheet before marking your answers.**
10. Each question is provided with four choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and darken the bubble corresponding to the question number using Blue or Black Ball-Point Pen in the OMR answer sheet.
11. **Each correct answer carries 1 mark and for each wrong answer 1/3 mark will be deducted. No negative mark for unattended questions.**
12. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the Register Number Coding Sheet and that the Invigilator has affixed his/her signature in the space provided.
13. Strict compliance of instructions is essential. Any malpractice or attempt to commit any kind of malpractice in the Examination will result in the disqualification of the candidate.

SEAL

144/2017

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Who started the first printing press in Kerala?
   (A) Herman Gundest (B) Benjamin Bailey
   (C) Annie Besant (D) Kuriakose Elias

2. Which was the title given to Pandit Karuppan by Kerala Varma Valiyakoil Thampuran?
   (A) Bhooshan (B) Vidwan
   (C) Adhikari (D) Sreeman

3. The Royal Proclamation related to Channas agitation was issued on which date?
   (A) July 26 1859 (B) July 26 1857
   (C) June 26 1858 (D) June 26 1857

4. Who was the editor of 'Mitavadi'?
   (A) C. Krishnan (B) K.Kelappan
   (C) C. Kesavan (D) Dr. Palpu

5. The 'Savarnajadha' lead by Mannathu Padmanabhan submitted the Demand before :
   (A) Regent Sethu Lakshmi Bhai (B) Kerala Varma Valiyakoil Thampuran
   (C) Sree Moolam Thirunal (D) Sree Ayilyam Thirunal

6. Who is the author of Abhinjana Shakuntalam?
   (A) Kerala Varma Valiyakoil Thampuran (B) V.T. Bhattathiripad
   (C) Vallathol Narayana Menon (D) Ulloor

7. On which date India celebrates Kargil Vijay Diwas?
   (A) July 26 (B) July 22
   (C) June 28 (D) June 29

8. Who is the author of 'Kanneerum Kinavum'?
   (A) M.T. Vasudevan Nair (B) V.T. Bhattathirippad
   (C) K.P. Kesavamenon (D) Kumaranasan

9. The temporary President appointed for the constituent assembly of India :
   (A) Dr. Rajendraprasad (B) B.R. Ambedkar
   (C) Sachidananda Sinha (D) V.P. Menon

10. Which Indian act is called the 'Stellas Example of Rural Development in the World Bank's Report of 2014?

(A) RTIA
(B) FSA
(C) RTSA
(D) NRGEA

11. Who is popularly called Viplavathinte Shukranakshathram'?

(A) Vallathol
(B) Ulloor
(C) Kumaranashan
(D) Changampuzha

12. The first college in Kerala was founded by :

(A) Church Missionary Society
(B) Theosophical society
(C) Jesuits Society
(D) East India Company

13. Which social reformer pioneered the Ooroottambalam agitation?

(A) Sahodaran Aiyyappan
(B) Chattambi Swamikal
(C) Sreenarayana Guru
(D) K. Kelappan

14. What provision is included in the 18th part of Indian constitution?

(A) Dissolving State Governments
(B) Declaring Emergency
(C) Special power to miltary
(D) Minority Rights

15. Mannathu Padmanabhan was appointed President of which Devaswom Board?

(A) Guruvayoor
(B) Malabar
(C) Travancore
(D) Kochi

16. Who is the former Supreme court Chief Justice appointed to recommend reform measures in Indian cricket?

(A) V.V. Giri
(B) J.M. Lodha
(C) H.L. Dattu
(D) T.S. Thakur

17. The first meeting of S.N.D.P. Yogam was convened in the leadership of Sree Narayana Guru at .

(A) Aruvippuram
(B) Aluva
(C) Kalady
(D) Aruvikkara

18. Who was the foundes editor of 'Sadhujanaparipalini'?

(A) Kali Chodikuruppan
(B) Ayyankali
(C) Poikagil Yohannan
(D) Sahodaran Ayyappan

19. The CBI Judge who convicted Gurmeet Ram Rahim Singh :

(A) Jagdeep Sharma (B) Jagdeep Singh

(C) Jagjeevan Sinha (D) Jayadeep Sahu

20. Which Section of IPC covers the offense of criminal conspiracy?

(A) 120 A (B) 420

(C) 308 (D) 307

21. Communication of SCR requires that :

(1) anode current is reduced below holding current

(2) anode voltage is reduced to zero

(3) anode current is allowed to reverse

(4) anode voltage gets reversed

From these, the correct statements are:

(A) all (B) (1), (2) , (3)

(C) (1), (3), (4) (D) (1), (2) , (4)

22. Two heaters rated as 2000W, 250 V are connected in series across a 250 V, 50 Hz ac mains. The total energy consumption for 6 minutes is :

(A) 400 Wh (B) 100 Wh

(C) 200 Wh (D) 500 Wh

23. The luminous efficiency of a sodium vapour lamp is ———— lumens per Watt.

(A) 40-50 (B) 50-100

(C) 120-200 (D) 10-12

24. Which one of the following statements regarding the two transistor model of the p-n-p-n four layer device is correct?

(A) It explains only the turn on portion of the device characteristics

(B) It explains only the turn off portion of the device characteristics

(C) It explains only the negative region portion of the device characteristics

(D) It explains all the regions of the device characteristics

25. Decimal equivalent of the hexadecimal number 65 is :

(A) 100 (B) 97

(C) 204 (D) 101

26. Differential relays are used for the protection of equipments against :

(A) over voltage (B) over current

(C) reverse current (D) internal fault

27. Buchholz relay is a :

(A) temperature actuated relay
(B) oil actuated relay
(C) gas actuated relay
(D) current actuated relay

28. The conditions for self excitation of dc series wound generator :

(1) There must be some residual magnetism in the field system
(2) The resistance of external circuit should be less than critical resistane
(3) The resistance of external circuit should be greater than critical resistance
(4) field winding assist residual magnetism

From the above, correct statement are

(A) (1) and (4) only
(B) (1), (2) and (4) only
(C) (1) and (3) only
(D) (1), (3) and (4) only

29. Torque developed by wave wound armature of a 4 pole DC machine having 774 conductors. flux/pole 24 mwb and armature current 50A is :

(A) 147.32 Nm
(B) 295.36 Nm
(C) 342.2 Nm
(D) 412.45 Nm

30. Least efficient power plant is :

(A) Thermal power plant
(B) Hydroelectric power plant
(C) MHD power plant
(D) Nuclear power plant

31. Half adder circuit can be constructed with :

(A) OR gate, AND gate
(B) OR gate, EX-OR gate
(C) AND gate, EX-OR gate
(D) AND gate, NOR gate

32. Two coils in differential connection have self inductance of 2 mH and 4 mH and a mutual inductance of 0.15 mH. The equivalent inductance of the combination is :

(A) 8.2 mH
(B) 6.42 mH
(C) 5.7 mH
(D) 20 mH

33. A series RLC circuit consisting of $R = 8\Omega$, $X_L = 8\Omega$ and $X_C = 2\Omega$ is connected across an ac supply of 230 V, 50 Hz. Power factor of the circuit is :

(A) 0.5
(B) 0.8
(C) 0.6
(D) 0.3

34. Measuring range of ammeter can be widely extended by using :

(A) low series resistance
(B) low shunt resistance
(C) high series resistance
(D) high shunt resistance

35. When a flywheeling diode is connected across a full converter supplying ripple-free current at controlled output voltage?

(1) dc voltage increases at higher value of α

(2) converter pf is improved

(3) SCR heating is reduced

From these, the correct statements are

(A) (2) , (3) (B) (2) only

(C) (1), (3) (D) (1), (2), (3)

36. In the lap wound and wave wound armatures of an 8 pole dc generator, generated emf will be in the ratio of :

(A) 8:1 (B) 4:1

(C) 1:8 (D) 1:4

37. The test used for the determination of no-load losses in a transformer is :

(A) SC test (B) break test

(C) Hopkinsons test (D) OC test

38. Efficiency of Induction motor is maximum at :

(A) full load (B) half load

(C) Iron loss equal to copper loss (D) Iron loss equal to half of copper loss

39. Slip of 6 pole,440V, 50 Hz induction motor is 4%. Its actual speed is :

(A) 960 rpm (B) 1000 rpm

(C) 1040 rpm (D) 1460 rpm

40. Two capacitors of 20 mfd and 5 mfd are connected in series. The effective capacitance is :

(A) 25 mfd (B) 15 mfd

(C) 100 mfd (D) 4 mfd

41. The emf per turn for a single phase 2200/440 V. 50Hz transformer is approximate 12 V. Then the number of secondary turns is :

(A) 184 (B) 37

(C) 15 (D) 157

42. A 15 KVA, 2200/110 V transformer when tested gave the following results

OC test , measurements on the L.V side : 400 W, 6A, 110 V

SC test, measurements on the H.V side : 1200 W, 10.5 A, 90 V

Then its percentage half load efficiency is

(A) 92.8 (B) 88.8

(C) 90.36 (D) 94.93

43. A resistance of 10Ω and inductance of 0.1 H are connected in series across 230 V 50 Hz. Then approximate current flowing through the circuit is :

(A) 7 A (B) 15 A

(C) 25 A (D) 10 A

44. Excitor in Alternator is used for supplying :

(A) DC to stator (B) AC to stator

(C) AC to rotor (D) DC to rotor

45. The value of load angle for a synchronous motor depends mainly upon its :

(A) excitation (B) Load

(C) speed (D) Supply voltage

46. Find the resistance of the load which takes a power of 5 KW from a shunt generator whose external characteristic is given by the equation $V - (250 - 0.5I_L)$:

(A) 11.98 (B) 12.5

(C) 12.8 (D) 13.5

47. What should be the kW rating of the motor which drives a 80 kW generator having an efficiency of 88.8 % ?

(A) 84 kW (B) 85 kW

(C) 90 kW (D) 92 kW

48. Laminated yoke in a dc motor can reduce :

(A) Iron loss (B) Speed regulation

(C) Temperature rise (D) Sparking on load

49. Colour code of a resistor is orange, orange, red, gold. Its value lies between :

(A) 3165 – 3435 (B) 3265 – 3355

(C) 3135 – 3465 (D) 3565 – 3735

50. Bulb turbines are :

(A) High speed turbine
(B) High pressure turbine
(C) Low head turbine
(D) High head turbine

51. A coil with large distributed capacitance has :

(A) low resonent frequency
(B) High resonent frequency
(C) low Q
(D) High Q

52. The maximum value of mutual inductance of two inductively coupled coils with self inductance $L_1 = 49\,mH$ and $L_2 = 81\,mH$ is :

(A) 130 mH
(B) 3969 mH
(C) 32 mH
(D) 63 mH

53. In series circuit, at resonance :

(A) impedenze is maximum
(B) current is maximum
(C) voltage is maximum
(D) all the above

54. Two incandescent lamps 60W and 40 W are connected in series across the mains. Then :

(A) the bulb together consumes 100 W
(B) the bulb together consumes 80 W
(C) the 60 W bulbs glows brighter
(D) the 40 W bulbs glows brighter

55. External characteristic of a dc generator is the relation between :

(A) load current and terminal voltage
(B) field current and generated emf
(C) Armature current and generated emf
(D) Load current and generated emf

56. Speed above normal of a dc shunt motor is obtained by :

(A) inserting a rheostat in armature circuit
(B) reducing back emf
(C) reducing applied voltage
(D) inserting a rheostat in field circuit

57. Maximum value of sinusoidal voltage having a frequency of 50 Hz is 200 V. The instantaneous value of this voltage at $t = 0.02$ sec :

(A) 117.56 V
(B) 123.54 V
(C) 0 V
(D) 118.32 V

58. A battery charger can drive a current of 5A into 1 ohm resistance connected at the output terminal. If it is able to charge an ideal 2V battery at 7A rate, then its Thevenin's equivalent will be :

(A) 7.5 V in series with 1.5 ohm
(B) 12.5 V in series with 1.5 ohm
(C) 14 V in series with 1 ohm
(D) 75 V in series with 1 ohm

59. Power Factor of RLC series circuit at resonance is :

(A) 0.866 laggin
(B) 0.866 leading
(C) 0.5 lagging
(D) Unity

60. The flux in a magnetic core is alternating sinusoidally at a frequency of 600 Hz. The maximum flux density is 2T and the eddy current loss is 15 W. Find the eddy current loss in the core if the frequency is raised to 800 Hz and the maximum flux density is reduced to 1.5 T :

(A) 15 W
(B) 30 W
(C) 7.5 W
(D) 10 W

61. A 4 pole 3 phase synchronous motor fed from 50 Hz mains is mechanically coupled to a 24 pole 3 phase synchronous generator. Then speed in rpm of the set is :

(A) 250
(B) 500
(C) 1,000
(D) 1,500

62. A 6 pole dc armature with 36 slots and 2 coil sides per slot is to be wave wound. Then back pitch is :

(A) 6
(B) 7
(C) 11
(D) 13

63. The process of current reversal while it crosse MNA is called :

(A) armature reaction
(B) Commutation
(C) Magnetostriction
(D) Synchronisation

64. In a common emitter amplifier, the unhypassed emitter resistance provides :

(A) negative voltage feedback
(B) positive voltage feedback
(C) voltage shunt feedback
(D) voltage series feedback

65. In Squirrel cage induction motor if stator slot is equal to or an integral multiple of rotor slot, create an alignment force. This phenomenon is known as :

(A) huntin
(B) Crawling
(C) cogging
(D) Creeping

66. Power consumed by a heater having two 20 Ω a heating element in parallel connected to 230 V 50Hz supply is

(A) 661 W
(B) 5290 W
(C) 2000 W
(D) 2645 W

67. An alternating current is given by $i = 4.242 \sin 377t$. Then rms of current is :

(A) 3 A
(B) 1.2 A
(C) 1.69 A
(D) 1 A

68. In the measurement of 3 phase power by two-wattmeter method, if one wattmeter indicate negative reading, the power factor of the circuit is :

(A) above 0.5
(B) Unity
(C) below 0.5
(D) Zero

69. An instruction which conert 38 H in accumulator to 83 H :

(A) XCG
(B) SWAP
(C) DAA
(D) POP

70. Three similar inductive coils are connected in star to a three phase four wire 415 V, 50 hz supply. The line current is 4 A at a power factor of 0.6 lagging. Then its coil resistance is _____ ohm.

(A) 48
(B) 103.75
(C) 60
(D) 36

71. The main advantage of using fractional pitch winding is to reduce :

(A) size of the machine
(B) harmonics in the emf
(C) amount of copper in the winding
(D) sparking in the machine

72. 10 micro farad capacitor in series with 1 megaohm resistor is connected across 100V DC supply. Its time constant is :

(A) 0.1 sec
(B) 10 sec
(C) 1 sec
(D) 0.001 sec

73. Two impedences of (12.86 +j 15.32) and (10.61– j 10.61) are connected in series and the combination takes a current of 2A.Then supply voltage is :

(A) 47.88V
(B) 64.5 V
(C) 81.32 V
(D) 121.2 V

74. The PMMC meter can measure :

(A) only dc quantities
(B) only ac quantities
(C) both ac and dc quantities
(D) only resistance

75. Anderson bridge is used for the measurement of :
(A) resistance (B) capacitance
(C) inductance (D) impedence

76. In a CRO, the quantity to be measured is applied across :
(A) Focusing electrod (B) X- plates
(C) Cathode (D) Y- plates

77. Working principle of transformer is:
(A) Lenz's law (B) Faraday's law of electrostatics
(C) Coloumb's law (D) Mutual Induction

78. Torque (Y axis) current (X axis) characteristic of a dc shunt motor at low load is :
(A) Straight line parallel to X axis
(B) Straight line parallel to Y axis
(C) Straight line passing through the origin
(D) Drooping line towards X axis

79. Ferranti effect states that under certain conditions the sending end voltage is :
(A) Less than receiving end voltage (B) Greater than receiving end voltage
(C) Equal to receiving end voltage (D) Abnormally high

80. The equal are criterion of stability is applicable to :
(A) One machine system and infinite busbars
(B) Two machine system and infinite busbars
(C) Multi machine system only
(D) None of the above

81. For variable Speed dc shunt motor, starter used is :
(A) star-delta starter (B) DOL starter
(C) Four point starter (D) Three point starter

82. Maximum speed at which a 440 V, 50 Hz Synchronous machine can operate :
(A) 6000 rpm (B) 3000 rpm
(C) 1500 rpm (D) 4500 rpm

83. In Fleming's left hand rule, thumb indicates :
(A) Magnetic field (B) Mechanical force
(C) Induced emf (D) Current flow

84. The inductive reactance of a transformer depends upon:

(A) Among of copper use
(B) Size of core
(C) Both (A) and (B)
(D) Leakage flux

85. DC shunt motor has :

(A) high Starting torque and is suitable for heavy duty applications
(B) Torque varying nearly as the square of the current
(C) Dangerously high speed at no load
(D) Almost constant speed

86. Running torque of induction machine is maximum, when :

(A) rotor resistance per phase equal to rotor reactance per phase
(B) rotor resistance per phase less than rotor reactance per phase
(C) rotor resistance per phase greater than rotor reactance per phase
(D) rotor resistance per phase equal to half of rotor reactance per phase

87. The function of interpoles in a dc machine is to :

(A) Reduce losses
(B) Reduce field winding leaking
(C) Improve commutation
(D) Compensate for air gap variation

88. The material commonly used for the sheaths of under ground cable is :

(A) Copper
(B) Lead
(C) Rubber
(D) Steel

89. Energy stored in a capacitor is :

(A) CV^2
(B) C^2V^2
(C) $\frac{1}{2} C^2V^2$
(D) $\frac{1}{2} CV^2$

90. If $A = (6 + j8)$ and $B = (3 - j4)$ then $A \times B$ is :

(A) $(18 - j24)$
(B) $(18 - j2\ 24)$
(C) $(50 + j0)$
(D) $(50 + j32)$

91. In Scot connection, the teaser transformer operates on 0.866 of its rated :

(A) Voltage
(B) Current
(C) Power
(D) Impedence

92. In a 3 phase synchronous motor magnitude of field flux:

(A) Varies with load
(B) remain constant at all load
(C) Varies with speed
(D) varies with power factor

93. A transformer has a hysterisis loss of 30 W at 240 V, 50 z. If voltage is reduced to 200 V what will be the hysterisis loss :

(A) 25 W
(B) 15 W
(C) 30 W
(D) 10 W

94. Which of the following method is best for determining voltage regulation of alternator?

(A) Potier method
(B) MMF method
(C) EMF method
(D) Impedence method

95. Star delta starting is equivalent to auto transformer starting with _____ % tapping.

(A) 83
(B) 33.3
(C) 50
(D) 57.7

96. For the protection of very long EHT line, relay used is :

(A) Percentage differential relay
(B) mho type distance relay
(C) Reactance type distance relay
(D) Impedance relay

97. Function of oscillator is :

(A) Generate dc from variable frequency ac
(B) Generate variable frequency ac from dc
(C) Generate dc power
(D) Generate high frequency power

98. What kind of insulator will be used if direction of transmission line is changed?

(A) Suspention type
(B) Pin type
(C) Shackle
(D) Strain

99. If stator frequency 50hz and rotor frequency 1 5 hz percentage slip of that induction motor is .

(A) 5
(B) 10
(C) 3
(D) 7

100. Three resistances each of value 3 ohm are connected in delta. Their value in each branch of equivalent star connection is :

(A) 3
(B) 1
(C) 9
(D) 6