DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO

BMRCL COMPETITIVE EXAMINATION – 2010

Category - 7

Question Booklet Version Code **V3**

Reg. No.

Day & Date of Exam : Friday, 30th April 2010

Time : 10.00 a.m. to 12.30 p.m.

Max. Marks : 100

Total Duration : 150 Minutes

Maximum Time for Answering : 120 Minutes

DO's

1. Enter the CENTRE CODE and shade the respective circles on the OMR answer sheet.
2. Enter the REGISTER NUMBER and shade the respective circles on the OMR answer sheet.
3. This Question Booklet is issued to you by the invigilator after the 2nd Bell i.e., after 10.15 a.m.
4. The Serial Number of this question booklet should be entered on the OMR answer sheet.
5. The Version Code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
6. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.
7. The 1st OR 2nd point printed in Kannada matter should be copied as it is in the OMR answer sheet at the space provided.

DON'Ts

1. **THE TIMING MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. Until the 3rd Bell is rung at 10.30 a.m.:
   - Do not remove the seal / staple present on the right hand side of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.

INSTRUCTIONS TO CANDIDATES

1. This question booklet contains 100 questions and each question will have four different choices / options.
2. After the 3rd Bell is rung at 10.30 a.m., remove the seal / staple present on the right hand side of this question booklet and start answering on the OMR answer sheet.
3. During the subsequent 120 minutes:
   - Read each question carefully.
   - Choose one correct answer from out of the four available options / choices given under each question.
   - **Completely darken / shade the relevant circle with a BLUE OR BLACK INK BALLPOINT PEN against the question number on the OMR answer sheet.**

CORRECT METHOD OF SHADING THE CIRCLE ON THE OMR SHEET IS SHOWN BELOW

(a) (b) ● (d)

4. Please note that even a minute unintended ink dot on the OMR sheet will also be recognised and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
5. Use the space provided on the question booklet for Rough work AND do not use the OMR answer sheet for the same.
6. After the last bell is rung at 12.30 p.m., stop writing on the OMR answer sheet and affix your LEFT HAND THUMB IMPRESSION on the OMR answer sheet as per the instructions.
7. Hand over the OMR ANSWER SHEET to the room invigilator as it is.
8. After separating and retaining the top sheet (KEA Copy), the Invigilator will return the bottom sheet replica (Candidate's copy) to you to carry home for self-evaluation.
9. Preserve the replica of the OMR answer sheet for a minimum period of One year.

ಗಮನಿಸಿ : ಸೂಚನೆಗಳ ಕನ್ನಡ ಅನುವಾದವು ಪ್ರಶ್ನೆಯ ಮುಂಭಾಗದಲ್ಲಿ ಮುದ್ರಿಸಲ್ಪಟ್ಟಿದೆ.

1

1. Zener diodes are operated in
   (a) Forward biased, because they have a very stable breakdown voltage
   (b) Reverse breakdown, because they have very unstable breakdown voltage
   (c) Forward biased, because they have a very unstable reverse breakdown voltage
   (d) Reverse breakdown, because they have a very stable breakdown voltage

2. Zener diode is called voltage regulator also, because it maintain
   (a) Constant current and variable output voltage
   (b) Constant output voltage and variable current
   (c) Both current and voltage remain constant
   (d) Both current and voltage are variable

3. A barrier voltage polarity at PN Junction is
   (a) Depends on majority charge carrier
   (b) Negative on N-side and Positive on P-side
   (c) Positive on N-side and Negative on P-side
   (d) Depends on minority charge carrier

4. When a diode is in forward biased, capacitance present at P-N Junction known as
   (a) Depletion layer capacitance
   (b) Stray capacitance
   (c) Diffusion capacitance
   (d) Parasitic capacitance

5. A series circuit consists of 4.7 KΩ, 5.6 KΩ, 9 KΩ and 10 KΩ resistors. Which resistor has the most voltage across it ?
   (a) 4.7 KΩ (b) 5.6 KΩ
   (c) 9 KΩ (d) 10 KΩ

6. In a hydroelectric plant a conduct system for taking water from the intake to the turbine is known as
   (a) Dam
   (b) Reservoir
   (c) Penstock
   (d) Surge tank

7. Resistance is a property of the circuit which opposes
   (a) The flow of current
   (b) The rate of change of current
   (c) The rate of change of voltage
   (d) None of these

8. Gas turbine is widely used in
   (a) Pumping stations
   (b) Aircraft
   (c) Locomotives
   (d) Automobiles

9. Power consumed in a pure inductor and capacitor is
   (a) Very small (b) Very large
   (c) 0 (d) None of these

10. The need for carrier wave exists because
    (a) The transmission of audio waves is impracticable
    (b) The length of aerial would be very large
    (c) The transmitter would need very high power
    (d) All the above

11. Resistance is that property of a circuit element
(a) Which absorbs electrical energy supplied to it in the form of heat and light
(b) In which electrical energy is stored in the form of electrostatic field
(c) In which electrical energy is stored in the form of electromagnetic field
(d) None of the above

12. The process of superimposing signal wave on the carrier wave is known as
(a) Filtration
(b) Rectification
(c) Demodulation
(d) Modulation

13. Active electrical circuit elements are
(a) Those elements which absorb electrical energy supplied to them in the form of heat or light
(b) Those capable of storing electrical energy supplied to them in the form of electrostatic field
(c) Those capable of storing electrical energy supplied to them in the form of electromagnetic field
(d) Those capable of only delivering energy

14. The merit of frequency modulation over amplitude modulation is that
(a) Channel width is small
(b) More power is consumed
(c) The modulated signal contains all fundamental and harmonic frequencies of sign
(d) Can be employed in all wave bands

15. The minimum frequency band required for telecasting is
(a) 10 MHz
(b) 6 to 7 MHz
(c) 3000 MHz
(d) 300 KHz

16. Amplitude modulation is used for broadcasting because
(a) It is more noise immune
(b) Requires less transmitting power
(c) Needs a simple receiver
(d) Provides necessary bandwidth for high fidelity

17. In a TV telecasting, the video signal is transmitted using
(a) Frequency modulation
(b) Pulse modulation
(c) Amplitude modulation
(d) None of the above

18. In a FM system the characteristic of carrier signal changes in respect of
(a) Amplitude
(b) Frequency
(c) Phase
(d) Frequency and Phase

19. A TRF receiver has an amplifier stage operated as
(a) Class A
(b) Class B
(c) Class C
(d) None of the above

30. A megger is an instrument used for measuring

(a) Very high voltage

(b) Very low voltage

(c) Very low resistance

(d) Very high resistance

31. Ferranti effect in transmission lines is due to the presence of

(a) Line inductance

(b) Line capacitance

(c) Line capacitance and inductance

(d) Line resistance and capacitance

32. The piezoelectric effect in a crystal is

(a) A change in frequency with temperature

(b) An ultrasonic wave caused by pressure

(c) A change in resistance because of pressure

(d) A voltage developed because of mechanical stress

33. The Buchholz relay prevents the transformer from

(a) All type of internal faults

(b) Turn to turn fault

(c) Winding to winding faults

(d) None of them

34. A strain gauge has a

(a) Piezo electric effect

(b) Piezo capacitive effect

(c) Piezo resistive effect

(d) Piezo inductive effect

35. Out of the following which one is not a renewable source of energy ?

(a) Tidal (b) Geothermal

(c) Nuclear (d) Wind

36. In an integrator the feedback element

(a) Resistor

(b) Zener diode

(c) Voltage deviser

(d) Capacitor

37. Pulverized coal is

(a) Coal free from ash

(b) Non smoking coal

(c) Coal which burns for long time

(d) Coal broken into fine particles

38. A LVDT usually has 2 secondaries connected in

(a) Series aiding

(b) Series opposition

(c) Parallel aiding

(d) Parallel opposition

39. As steam expands in turbine

(a) Its pressure increases

(b) Its specific volume increases

(c) Its boiling point increases

(d) Its temperature increases

40. The dimension of force is

(a) LM (b) LMT

(c) LMT^{-1} (d) LMT^{-2}

41. In a steam turbine cycle, the lowest pressure occurs in

(a) Turbine inlet

(b) Boiler

(c) Condensor

(d) Super heater

42. A phenomena of creeping occurs in

(a) Watt hour meter

(b) Wattmeter

(c) Voltmeter

(d) Ammeter

43. For low head and high discharge, the hydraulic turbine used is

(a) Kaplan turbine

(b) Francis turbine

(c) Pelton wheel

(d) Jonnal turbine

44. The ideal characteristics of a voltage stabilizer is

(a) Constant output voltage with low internal resistance

(b) Constant output current with low internal resistance

(c) Constant output voltage with high internal resistance

(d) Constant internal resistance with variable output voltage

45. Cost of operation of which plant is least?

(a) Gas turbine plant

(b) Thermal power plant

(c) Nuclear power plant

(d) Hydroelectric plant

46. In a transistor α is related to β by the relation

(a) $\beta = \frac{\alpha+1}{\alpha}$ (b) $\beta = \frac{\alpha-1}{\alpha}$

(c) $\beta = \frac{\alpha}{1-\alpha}$ (d) $\beta = \frac{\alpha}{\alpha+1}$

47. Common base configuration is little used because

(a) It has high input impedance

(b) It has low input impedance

(c) It does not heat up

(d) It has very high gain

48. B earns 20% more than A, C earns 25% more than B and D earns 30% more than C. If D earns Rs. 975-00, then how much does A earn ?

(a) 500

(b) 550

(c) 600

(d) 750

49. Which among the following states has unicameral legislature ?

(a) Madhya Pradesh

(b) Maharashtra

(c) Bihar

(d) Jammu and Kashmir

50. A boat takes 8 hours and 48 minutes while traveling against the current from a place A to a place B. While traveling along the current it takes just 4 hours for this journey. Find the ratio of speed of the boat to that of river.

(a) 2 : 1 (b) 8 : 3

(c) 3 : 2 (d) 2 : 5

51. German Missionary Herman Mogling is associated with
(a) St. Aloysius Church
(b) Jnanodaya
(c) Mangalooru Samachara
(d) Nyaya Sangraha

52. In a competitive examination a student answered 15 of the first 20 questions correctly and of the remaining questions he answered $\frac{1}{3}$ correctly. All the questions carried equal marks and there was no negative marking. If the student gets 50% marks, how many questions were there in the question paper ?
(a) 40 (b) 60
(c) 80 (d) 50

53. The Rajiv Gandhi National Park in Karnataka is situated at
(a) Chamarajanagar
(b) Bandipura
(c) Chikkamagalur
(d) Nagarahole

54. Mohan rode his bicycle from home to school, a distance of 6 km, at an average speed of 12 km/hr. He returned home from school by walking at an average speed of 4 km/hr. What is his average speed for the complete trip ?
(a) 8 km/hr
(b) 10 km/hr
(c) 6 km/hr
(d) 7.5 km/hr

55. The metal compound is found in sindhoor is based on
(a) Tin (b) Silver
(c) Copper (d) Zinc

56. A certain number of camels and equal number of men are going together. Half of the owners are on their camels back, while the remaining owners are walking with their camels. If the number of legs walking on the ground is 100, how many camels are there ?
(a) 25
(b) 20
(c) 30
(d) 24

57. 73rd and 74th Amendments to the Constitution of India are associated with
(a) Right to Information Act
(b) Pay and Perks to MPs
(c) Panchayat Raj Institutions
(d) Women Reservation Bill

58. Ashok spends $\frac{1}{8}$ of the money for mangoes and $\frac{1}{7}$ of the remaining money for sweets and then with the left over money he goes to a hotel and spends $\frac{1}{6}$ of the money to buy idlies. With the remaining money he spends $\frac{1}{5}$ to buy flowers and with $\frac{1}{4}$ of the left over amount he buys a cricket ball. Finally he is left with Rs. 48. How much money did Ashok have in the beginning ?
(a) Rs. 90
(b) Rs. 80
(c) Rs. 100
(d) Rs. 128

59. Vinegar is the trade name of
(a) Acetic acid
(b) Chloroform
(c) Carbon tetrachloride
(d) Ethyl alcohol

60. A and B can do a piece of work in 12 days; B and C can do it in 15 days and C and A can do it in 20 days. A alone can do the work in

(a) $15\frac{2}{3}$ days (b) 24 days

(c) 40 days (d) 30 days

61. The following characteristic does not necessarily apply to an Op-Amp

(a) High gain

(b) Low power

(c) High input impedance

(d) Low output impedance

62. The sum of the ages of a father and his son is 100 years now. Five years ago, their ages were in the ratio of 2 : 1. The ratio of the ages of father and son after 10 years will be

(a) 5 : 3

(b) 4 : 3

(c) 3 : 5

(d) 10 : 7

63. Virtually all Op-Amp application use

(a) Positive feedback

(b) Open loop

(c) Negative feedback

(d) All of these

64. The sum and product of two numbers are 12 and 35 respectively. The sum of their reciprocals will be

(a) $\frac{12}{35}$ (b) $\frac{1}{35}$

(c) $\frac{35}{8}$ (d) $\frac{7}{32}$

65. Op-Amp is a _____ Amplifier.

(a) Low gain (b) Mid gain

(c) High gain (d) No gain

66. The average of 100 numbers is 44. The average of these 100 numbers and four other new numbers is 50. The average of the four new numbers will be

(a) 800 (b) 176

(c) 24 (d) 200

67. How many full adder is required for the 4 – bit parallel binary addition ?

(a) 3 (b) 5

(c) 4 (d) 7

68. If $\frac{2592}{\sqrt{x}} = 324$, then $x =$

(a) 144 (b) 64

(c) 16 (d) 8

69. For half adder circuit, the carry is generated when

(a) Any one input is high

(b) Both inputs are low

(c) Both inputs are high

(d) Any one input is low

70. $\frac{(716+384)^2 - (716-384)^2}{(716 \times 384)} =$

(a) 716 (b) 384

(c) 4 (d) 1100

71. Which of the following characteristics does not follow ideal diode?

(a) Forward resistance is zero

(b) Reverse resistance is infinity

(c) Reverse saturation current is 10 mA

(d) The cut-in voltage is zero

72. The principle on which a transformer works is based on
(a) Self induction
(b) Leakage reactance
(c) Power transfer
(d) Mutual induction

73. Zener breakdown voltage
(a) Increases with temperature
(b) Decreases with temperature
(c) Is independent of temperature
(d) Is independent of temperature and reverse bias

74. The no-load current in a transformer has a
(a) High power factor
(b) Low power factor
(c) Unity power factor
(d) Zero power factor

75. The output of a rectifier contains
(a) Only DC component
(b) Pulsating AC component
(c) Only AC component
(d) Pulsating DC component

76. The flux in the core of a transformer from no load to full load
(a) Remains constant
(b) Varies with the load current
(c) Varies as square of the load current
(d) Varies inversely with load current

77. The voltage induced in a DC generator depends on
(a) Speed
(b) Size of the pole
(c) Size of the conductor
(d) The material of winding

78. The process of making the external thread is called
(a) Tapping
(b) Dieing
(c) Forming
(d) Knurling

79. In a lap wound DC generator, the number of parallel paths for the armature winding is
(a) 2
(b) 3
(c) one
(d) equal to number of poles

80. The part which clamps the work piece in the lathe is called
(a) Head stock (b) Tail stock
(c) Tool post (d) Chuck

81. In a 8 pole wave wound DC generator, the number of parallel paths in the armature is
(a) 8 (b) 6
(c) 4 (d) 2

82. The top portion of the drill bit is called
(a) Shank (b) Neck
(c) Lip (d) Heal

83. Sparking in the brushes of a DC generator can be minimized by
(a) Using low resistance carbon brushes
(b) High resistance carbon brushes
(c) By using a strong spring to hold the brushes against commutator
(d) By matching the curvature of brush contact surface with that of commutator

84. Thread cutting is done on the
(a) Shaping machine
(b) Milling machine
(c) Drilling machine
(d) Lathe

85. When you want to use a generator for general lighting or battery charging, you prefer
(a) A shunt generator
(b) A series generator
(c) A cumulatively compounded generator
(d) A differentially compounded generator

86. Gears that are used to transmit power between two shafts when their axis is parallel and coplanar
(a) Bend gear
(b) Spur gear
(c) Spiral gear
(d) Worm and worm gear

87. When we talk of back emf or torque in DC machines, we are talking about
(a) DC generator (b) AC – DC convertor
(c) DC motor (d) Thyristors

88. If the center distance between two shafts is too long the _____ is used to transmit power.
(a) Gear (b) Coupling
(c) Clutch (d) Belt

89. The speed of a DC motor _____ the flux.
(a) Is directly proportional to
(b) Is inversely proportional to
(c) Varies as square of
(d) Varies as inverse square of the flux

90. More power is transmitted through
(a) Gears (b) Belt
(c) Chain (d) Rope

91. The speed of a DC motor
(a) Can be controlled
(b) Cannot be controlled
(c) Can only be increased
(d) Can only be reduced

92. Convert octal number 567 into binary
(a) 101110111 (b) 101111110
(c) 110101111 (d) 111101110

93. A series motor is used for traction purpose only because
(a) Its starting speed is high
(b) Its starting torque is high
(c) Its starting current is low
(d) There is no back emf

94. A starter used in starting a motor
(a) Introduces large resistance in armature circuit and progressively cuts off as the handle is moved
(b) Introduces a small resistance in armature circuit and progressively introduces larger resistance as the handle is moved
(c) Introduces high resistance in the field circuit which is cutoff as the handle is moved
(d) Introduces low resistance in the field which increases as the handle is moved

10

ಸೂಚನೆ : ಕೆಳಗಿನ ವಾಕ್ಯದಲ್ಲಿ ಪದಗಳು ಕ್ರಮಬದ್ಧವಾಗಿಲ್ಲ. ಅವು ಅರ್ಥಪೂರ್ಣವಾಗುವಂತೆ ಗೆರೆ ಹಾಕಿ ಸೂಚಿಸಿದ ಭಾಗಗಳನ್ನು ಪುನಃ ಜೋಡಿಸಿ, ಅವುಗಳ ಅನುಕ್ರಮವನ್ನು ಗುರುತಿಸಿ.

95. ನೀ ಕನ್ನಡವಾಗಿರು (P) ಎಂದೆಂದಿಗೂ (Q) ಎಂತಾದರು ಇರು (R) ಎಲ್ಲಾದರು ಇರು (S)

(a) SQPR (b) RPSQ (c) SRQP (d) QSPR

ಸೂಚನೆ : ಕೆಳಗೆ ಕೊಟ್ಟ ಶಬ್ದಕ್ಕೆ ವಿರುದ್ಧಾರ್ಥಕವಾದ ಶಬ್ದವನ್ನು ಗುರುತಿಸಿ.

96. ಚೇತನ

(a) ಜಡ (b) ಜಡತಿ (c) ಜಡೆ (d) ಜಡಧಿ

ಸೂಚನೆ : ಕೆಳಗಿನ ವಾಕ್ಯದಲ್ಲಿ ದೋಷವಿರುವ ಭಾಗವನ್ನು ಗುರುತಿಸಿ. ವಾಕ್ಯ ದೋಷವಿಲ್ಲದಿದ್ದರೆ 'ತಪ್ಪಿಲ್ಲ' ಎಂದು (d) ಭಾಗವನ್ನು ಗುರುತಿಸಿ.

97. 'ಇಂದ' (a) ಇದು ತೃಥೀಯ (b) ವಿಭಕ್ತಿ ಪ್ರತ್ಯಯವಾಗಿದೆ. (c) ತಪ್ಪಿಲ್ಲ. (d)

98. How foolish he is _____ The correct punctuation to be used at the end of the sentence is

(a) Full stop

(b) Exclamatory mark

(c) Comma

(d) Question mark

99. I am sure you will be more careful, _____ ? The question tag to be added is

(a) will you (b) don't you (c) aren't I (d) won't you

100. Tigers won't attack _____ they are hungry. The conjunction in the blank is

(a) unless (b) if (c) since (d) because

20. In radiotelegraphy system information is transmitted
    (a) Directly by carrier waves at radio frequency without modulation
    (b) Directly by carrier waves at radio frequency with modulation
    (c) Directly by modulating signal
    (d) Both (a) and (c)

21. An aerial is
    (a) An antenna for transmitting radio wave
    (b) An antenna for receiving radio waves
    (c) For modulation and demodulation of signal waves
    (d) A resonant circuit to receive only desired frequency

22. The function of a microphone is to
    (a) Convert electrical signal to audio signal
    (b) Convert audio signal into electrical signal.
    (c) Convert electrical signal to amplified audio signal
    (d) Modulate the signal

23. Detection is a process of
    (a) Separating signal wave from carrier wave
    (b) Searching out for the RF signal
    (c) Combining signal wave carrier wave
    (d) None of the above

24. A moving coil permanent magnet ammeter can be used to measure
    (a) DC and AC currents
    (b) AC currents only
    (c) DC currents only
    (d) Voltage

25. An FET has a gate source bias of 2 volt. The AC input signal is ±1.2 volt. The class of operation is
    (a) A
    (b) B
    (c) C
    (d) AB

26. A thermocouple meter can be used to measure
    (a) AC only
    (b) DC only
    (c) Both (a) and (b)
    (d) None of these

27. The gain of an amplifier with feedback is given by the relation
    (a) $\frac{A}{1+A\beta}$ (b) $\frac{\beta}{1+A\beta}$
    (c) $\frac{\beta}{1-A\beta}$ (d) $\frac{A}{1-A\beta}$

28. Swamping resistance is used in moving coil instruments to reduce errors due to
    (a) Thermal EMF
    (b) Voltage
    (c) Power
    (d) Temperature

29. An ideal voltage amplifier should have
    (a) $R_i = 0,\ R_o = 0$
    (b) $R_i = 0,\ R_o = \infty$
    (c) $R_i = \infty,\ R_o = 0$
    (d) $R_i = \infty,\ R_o = \infty$