

**MIZORAM PUBLIC SERVICE COMMISSION**  
**COMMON COMPETITIVE EXAMINATION FOR**  
**GROUP 'B' NON-GAZETTED (TECHNICAL)**  
**JUNIOR ENGINEER (CONTRACT BASIS) (ELECTRICAL)**  
**UNDER POWER & ELECTRICITY DEPARTMENT,**  
**GOVERNMENT OF MIZORAM, NOVEMBER-2024**

**PAPER-IV (ELECTRONICS ENGINEERING)**

Time Allowed : 2 hours

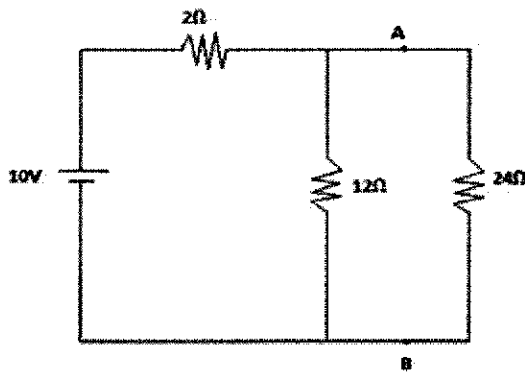
FM : 200

*All questions carry equal mark of 2 each.*

*Attempt all questions.*

1. Which of the following is not correct?
  - (a) Voltage source is an active element
  - (b) Current source is a passive element
  - (c) Resistance is a passive element
  - (d) Conductance is a passive element
2. An Ideal voltage source –
  - (a) has terminal voltage in proportional to current
  - (b) has terminal voltage in proportional to load
  - (c) has zero internal resistance
  - (d) has open circuit voltage nearly equal to the voltage on full load
3. The superposition theorem is applicable to –
  - (a) Current only
  - (b) Voltage only
  - (c) Power only
  - (d) Current, Voltage and Power
4. In Ideal transformer at no load, the primary applied voltage is balanced by
  - (a) The secondary voltage
  - (b) The drop across resistance and reactance
  - (c) The secondary induce emf
  - (d) The primary induce emf
5. A passive network has –
  - (a) no emf source
  - (b) no current source
  - (c) neither emf nor current source
  - (d) has emf but no current source
6. An inductor stores energy in –
  - (a) magnetic field
  - (b) electrostatic field
  - (c) core
  - (d) electromagnetic field
7. The current flowing in  $L$  and  $C$  at parallel resonance are –
  - (a) zero
  - (b) equal
  - (c) infinite
  - (d) different
8. The transformer is used to change the value of –
  - (a) Voltage
  - (b) Frequency
  - (c) Infinite
  - (d) Power factor

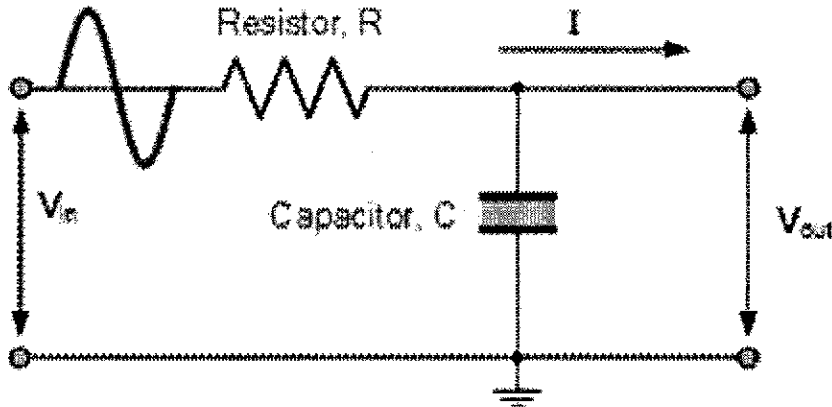
9. Rating of transformer is given in –  
(a) kVAR (b) kV  
(c) kVA (d) Watt
10. Transformer is used to change the value of  
(a) Voltage (b) Frequency  
(c) Power (d) Power factor
11. Source transformation technique is mainly based on \_\_\_\_\_ law.  
(a) Newton's (b) Kirchhoff's  
(c) Ohm's (d) Einstein's
12. Find the voltage across  $24\ \Omega$  resistor by using Thevenin's theorem.



- (a) 8V (b) 9V  
(c) 1V (d) 6V
13. Transformers work on the principle of –  
(a) self induction (b) mutual induction  
(c) faraday's law of electromagnetic induction (d) self and mutual induction
14. Distribution transformers are designed to have maximum efficiency nearly –  
(a) at full load (b) 50% of full load  
(c) 25% of full load (d) at no load
15. In transformer the purpose of breather is to –  
(a) extract moisture from the air (b) take insulating oil from the conservator  
(c) provide cooling to the winding (d) provide insulation to the winding
16. Two equal sized transformers A and B are connected in parallel. The impedance of A is more than the impedance of B. Then –  
(a) both will share the load equally (b) A will supply more load than B  
(c) B will supply more load than A (d) load supply is not effected
17. If the battery of multimeter is weak, it will give –  
(a) accurate reading (b) more reading  
(c) less reading (d) no reading
18. The meter used for measuring electrical power is called –  
(a) kWh meter (b) Voltmeter  
(c) Ammeter (d) Wattmeter

19. High a.c voltage are usually measured with a –  
(a) Voltmeter and current transformer (b) Millivoltmeter and shunt  
(c) Voltmeter and multiplier (d) Voltmeter and potential transformer
20. A volt meter has an accuracy of  $\pm 3\%$  of full scale 250 V range is employed to read 150V. The actual voltage value will fall within the range –  
(a) 140.5 to 150.5 V (b) 143 to 150 V  
(c) 142.5 to 157.5 V (d) 147 to 153
21. Thermistor have –  
(a) high and negative temperature coefficient (b) low and negative temperature coefficient  
(c) high and positive temperature coefficient (d) low and positive temperature coefficient
22. Piezometer is used to measure –  
(a) Very high pressure (b) Pressure in pipes and channels  
(c) Very low pressure (d) Diffrence of pressure between two points
23. A CRO uses –  
(a) electromagnetic focusing (b) electro - static focusing  
(c) both focusing techniques (d) no focusing techniques
24. An accurate ammeter must have a resistance of –  
(a) high value (b) low value  
(c) very low value (d) very high value
25. Hysteresis in an instrument means –  
(a) the reliability of the instrument  
(b) the repeatability of the instrument  
(c) the change in the same reading when the input is first increased and then decreased  
(d) the inaccuracy due to change in temperature
26. What must flow in the coil of any meter to produce a movement of pointer?  
(a) Voltage (b) Resistance  
(c) Watts (d) Current
27. The elements in RCL series circuit are –  
(a) Resistance only (b) Inductance only  
(c) Capacitance only (d) Capacitance, resistance and inductance
28. An ideal voltage source should have –  
(a) zero source resistance (b) very high voltage  
(c) very low voltage with high current (d) large ampere
29. Moving coil magnet instruments can be used on –  
(a) a.c and d.c (b) a.c. only  
(c) d.c. only (d) half wave rectified a.c.
30. In order to find Thevenin's resistance voltage source must be –  
(a) replace with inductor (b) replace with resistor  
(c) open circuit (d) short circuit

31. In a three phase full wave rectifier, each diode conducts for a duration of –  
(a)  $180^\circ$  (b)  $30^\circ$   
(c)  $60^\circ$  (d)  $45^\circ$
32. A capacitor of  $100\ \mu\text{F}$  is charged to  $10\text{V}$  through a resistance of  $10\ \text{K}\ \Omega$ . It will be fully charged in –  
(a) 5 sec (b) 0.1 sec  
(c) 1 sec (d) 0.5 sec
33. The circuit show below is –



- (a) low pass filter (b) high pass filter  
(c) band pass filter (d) band stop filter
34. The limitation of voltage multiplying circuit is that –  
(a) the output has high ripple content (b) high voltage output is difficult to obtain  
(c) high output current is difficult to obtain (d) the size of the capacitors becomes very large
35. Varactor is a –  
(a) Non-linear resistor (b) Variable resistor  
(c) Non-linear capacitor (d) Non-linear inductor
36. A thyristor can be termed as –  
(a) DC Switch (b) AC Switch  
(c) Square wave switch (d) Both (a) & (b) are correct
37. In a thyristor, holding current is –  
(a) More than latching current  $I_L$  (b) Less than latching current  $I_L$   
(c) Equal to or latching current (d) Very small
38. Turn off time of an SCR is measured from the instant –  
(a) anode current becomes zero  
(b) anode voltage becomes zero  
(c) gate current becomes zero  
(d) anode voltage and anode current becomes zero at the same time
39. Which of the following circuit is used for timing purposes?  
(a) A stable multivibrator (b) Bistable multivibrator  
(c) Monostable multivibrator (d) Very stable multivibrator
40. In single phase full converter, the output voltage during overlap is equal to –  
(a) Zero (b) Source voltage  
(c) Source voltage minus the inductance drop (d) Load voltage

41. TRIAC is equivalent to –
- (a) two SCRs connected in parallel
  - (b) two SCRs connected in antiparallel
  - (c) one SCRs and one diode connected in parallel
  - (d) one SCRs and one diode connected in series
42. Choppers converter –
- (a) AC to DC
  - (b) DC to AC
  - (c) DC to DC
  - (d) AC to AC
43. In a power transistor, \_\_\_\_\_ is the controlled parameter.
- (a)  $V_{BE}$
  - (b)  $V_{CE}$
  - (c)  $I_B$
  - (d)  $I_C$
44. A power BJT is used as a power control switch by biasing it in the cut off region (off state) or in the saturation region (on state). In the on state –
- (a) both the base-emitter & base-collector junctions are forward biased
  - (b) the base-emitter junction is reverse biased, and the base collector junction is forward biased
  - (c) the base-emitter junction is forward biased, and the base collector junction is reversed biased
  - (d) both the base-collector & the base-emitter junctions are reversed biased
45. In a VSI (Voltage source inverter) –
- (a) the internal impedance of the DC source is negligible
  - (b) the internal impedance of the DC source is very very high
  - (c) the internal impedance of the AC source is negligible
  - (d) the IGBTs are fired at 0 degrees
46. In a single-phase half wave inverter \_\_\_\_\_ SCR(s) are/is gated at a time.
- (a) one
  - (b) two
  - (c) three
  - (d) four
47. Which programming is commonly used for PLC?
- (a) C
  - (b) C++
  - (c) Python
  - (d) Ladder logic
48. What is the uses of PLC?
- (a) To read input signal
  - (b) To perform computing
  - (c) To control devices like motor and light
  - (d) To store data
49. What is the typical response time of PLC?
- (a) Micro second
  - (b) Mili second
  - (c) Second
  - (d) 2 second
50. In DC circuit, what is the uses of chopper
- (a) Rectification of DC
  - (b) To change the voltage level of DC
  - (c) To change the current level of DC
  - (d) To decrease ripple in rectifier
51. Which converter is used to convert DC to AC?
- (a) Rectifier
  - (b) Amplifier
  - (c) Inverter
  - (d) Modulation

52. Which component is commonly used in the output stage in chopper?  
(a) Transistor (b) Capacitor  
(c) Resistor (d) Inductor
53. What is the main purpose of inductor in buck converter?  
(a) Rectification (b) Decrease ripple  
(c) To store energy (d) For electromagnet
54. What is the filter used in rectifier?  
(a) LED (b) Resistor  
(c) Capacitor (d) SCR
55. What is a common control method for inverter?  
(a) Voltage control (b) Current control  
(c) PWM (pulse width modulation) (d) Frequency control
56. What is the meaning of inverter efficiency?  
(a) The ratio of a.c output to d.c power input (b) The total power loss  
(c) The speed of inverter operation (d) Voltage regulation capability
57. External control of dc input voltage can be obtained by the use of a –  
(a) transformer (b) chopper  
(c) inverter (d) converter
58. Who coined the term PLC?  
(a) Charles Babbage (b) Charles Dickens  
(c) Allen Border (d) Allen Bradley
59. Which of the following is the central processing unit of PLC?  
(a) I/O Module (b) Processor  
(c) Memory Unit (d) Power Supply
60. A metal oxide varistor (MOV) is used for protecting –  
(a) Gate circuit against over currents (b) Gate circuit against over voltages  
(c) Anode circuit against over currents (d) Anode circuit against over voltages
61. The antenna characteristic that measures its ability to focus signal is \_\_\_\_\_?  
(a) Bandwidth (b) Gain  
(c) Directivity (d) Impedance
62. In communication system the message comes from –  
(a) Coder (b) Decoder  
(c) Source (d) Receiver
63. A modulator is a system to –  
(a) separate two frequencies  
(b) impress the information on the radio frequency carrier  
(c) extract information from the carrier  
(d) amplify the audio frequency signal
64. The AM broadcast band is given by –  
(a) 10kHz to 30kHz (b) 500kHz to 1500kHz  
(c) 3MHz to 30MHz (d) 30MHz to 300MHz

65. In radio frequency receiver, the oscillator frequency required to tune 1000kHz signal should be –  
(a) 455kHz (b) 1455kHz  
(c) 645kHz (d) 1000kHz
66. The major advantage of a pre-selector stage in a receiver is that it provides –  
(a) Higher selectivity (b) Higher fidelity  
(c) Better linearity (d) Larger Band pass
67. In a broadcast receive, the local oscillator is tuned to a frequency higher than the incoming frequency to facilitate –  
(a) Image frequency rejection (b) Easier tracking  
(c) Adequate frequency coverage (d) Noise reduction
68. The filter required to obtain SSB and DSB signal is –  
(a) Low pass filter (b) High pass filter  
(c) Band stop filter (d) Band pass filter
69. The type of modulator amplifier used in AM transmitter is –  
(a) Class A (b) Class B  
(c) Class AB (d) Class C with negative feedback
70. Carrier wave is generated by crystal Oscillator because –  
(a) It has good stability (b) No buffer stage is needed  
(c) It provide high power output (d) Tuned circuit is not required
71. The disadvantage of *FM* over *AM* is that –  
(a) Noise is very high for high frequency signal (b) Larger bandwidth is required  
(c) High modulating power is required (d) High output power is required
72. The typical bandwidth of an *FM* receiver is –  
(a) 2kHz (b) 20kHz  
(c) 200kHz (d) 2000kHz
73. Which of the following has the least wavelength?  
(a) X-rays (b) Ultra violet rays  
(c) Infra-red (d) UHF
74. A *VHF* wave propagation exists with the help of –  
(a) Ionosphere (b) Lithosphere  
(c) Troposphere (d) Hydrosphere
75. The demodulation of the sound signal in a TV receiver is accompanied by –  
(a) linear detector (b) product detector  
(c) discriminator (d) envelope detector
76. The full form of RAM is –  
(a) Random access memory (b) Rarely access memory  
(c) Rapid access memory (d) Regular access memory
77. Which component connects storage devices like SSDs and HDDs to the motherboard?  
(a) A RAM slot (b) A SATA port  
(c) An USB port (d) SMPS

78. In computer Graphic card is also called –
- (a) CPU
  - (b) ROM
  - (c) GPU
  - (d) RAM
79. HDMI is used to transmit –
- (a) Video only
  - (b) Audio only
  - (c) Data only
  - (d) Both Video and Audio
80. \_\_\_\_\_ is a small but fast memory placed between the CPU and the main memory.
- (a) USB
  - (b) Primary memory
  - (c) ROM
  - (d) Cache memory
81. What does the acronym IP stand for in networking?
- (a) Internal program
  - (b) Integrated program
  - (c) International protocol
  - (d) Internet protocol
82. A hub is a \_\_\_\_\_ device.
- (a) Networking
  - (b) Software
  - (c) Calculating
  - (d) Cleaning
83. How is a single channel shared by multiple signals in a computer network?
- (a) multiplexing
  - (b) phase modulation
  - (c) analog modulation
  - (d) digital modulation
84. What is the term for the data communication system within a building or campus?
- (a) MAN
  - (b) LAN
  - (c) PAN
  - (d) WAN
85. What was the name of the first network?
- (a) ASAPNET
  - (b) ARPANET
  - (c) CNNET
  - (d) NSFNET
86. Which protocol is essential for secure remote access and management of systems, particularly in environments where security is critical?
- (a) HTT protocol
  - (b) SMT protocol
  - (c) SSH protocol
  - (d) SSL protocol
87. Which application is used for DTP?
- (a) Adobe premiere
  - (b) PageMaker
  - (c) Cool edit
  - (d) Auto CAD
88. When we defragment a hard drive, what it does?
- (a) Remove unwanted program
  - (b) Remove virus from all the drive which increase the speed
  - (c) Organize fragmented data for improved access speed
  - (d) Remove all unwanted hardware for ease of operating
89. When computer cannot turn ON, what is the first thing we have to do –
- (a) Check monitor
  - (b) Check Keyboard
  - (c) Check SMPS
  - (d) Check mouse
90. When we want to see registry, we press windows command and R and type –
- (a) regedit
  - (b) msconfig
  - (c) registry
  - (d) ping



91. ARM stands for –
- (a) Advanced Rate Machines
  - (b) Advanced RISC Machines
  - (c) Artificial Running Machines
  - (d) Aviary Running Machines
92. What is the benefit of arm processor in embedded system?
- (a) Can control everything
  - (b) Low power consumption
  - (c) Easy to program
  - (d) Task manager
93. What is the primary function of embedded system
- (a) To control motors
  - (b) Easy computing task
  - (c) To minimize human error
  - (d) Performing dedicated task
94. In arm processor  $L_1$  cache is –
- (a) Smallest and fastest
  - (b) Largest and fastest
  - (c) Largest and slowest
  - (d) Same as the other Cache
95. A cache in the ARM processor reduces –
- (a) memory size
  - (b) memory access time
  - (c) monitor size
  - (d) processor size
96. Which ARM feature helps prevent a process from accessing memory outside its allocated region?
- (a) Memory Mapping
  - (b) Page Table
  - (c) Memory Protection Unit (MPU)
  - (d) Address Space Layout Randomization (ASLR)
97. For real time operating systems, interrupt latency should be –
- (a) minimal
  - (b) maximum
  - (c) zero
  - (d) dependent on the scheduling
98. To prevent multiple tasks from accessing shared resources simultaneously which RTOS synchronization mechanism is used?
- (a) Mutex
  - (b) Semaphore
  - (c) LIFO
  - (d) FIFO
99. What is RTOS?
- (a) Reliable time operating system
  - (b) Rapid time operating system
  - (c) Realtime operating system
  - (d) Read and write term operating system
100. Which level simulates the algorithms that are used within the embedded systems?
- (a) algorithmic level
  - (b) switch level
  - (c) gate level
  - (d) circuit level

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