

PROVISIONAL ANSWER KEY

Question 158/2023/OL

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Exam: Instrument Mechanic

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Department Medical Education

Question1:-Which gauge is used to check the accuracy of an external thread?

A:-Snap gauge

B:-Thread ring gauge

C:-Thread plug gauge

D:-Centre gauge

Correct Answer:- Option-B

Question2:-Which electrical quantity affects the heat generated in a conductor?

A:-Voltage

B:-Current passed through it

C:-Square of the current

D:-Square of the resistance

Correct Answer:- Option-C

Question3:-In the slip gauge grades _____ is a calibration grade used as a standard for reference to test all the other grades.

A:-Grade I

B:-Grade II

C:-Grade '0'

D:-Grade '00'

Correct Answer:- Option-D

Question4:-The most accurate instrument used to set and check angles is _____

A:-Bevel gauge

B:-Vernier bevel protractor

C:-Protractor

D:-Sine bar

Correct Answer:- Option-D

Question5:-Which method of the soldering is used for quantity production and for tinning work?

A:-Dip soldering

B:-Soldering with a frame

C:-Soldering with soldering iron

D:-Soldering with gun

Correct Answer:- Option-A

Question6:-_____ is used to measure the size of a wire and thickness of sheet.

A:-Standard wire gauge

B:-Drill gauge

C:-Snap gauge

D:-Slip gauge

Correct Answer:- Option-A

Question7:-_____ Gauges have both 'Go' and 'No Go' ends are provided at the same end.

A:-Plug gauges

B:-Progressive plug gauge

C:-Ring gauge

D:-Snap gauge

Correct Answer:- Option-B

Question8:-_____ are gauge blocks used as standards for precision length measurement.

A:-Micro meter

B:-Sine bar

C:-Slip gauge

D:-Template

Correct Answer:- Option-C

Question9:-What is the effect of electric current on neon lamp?

A:-Heating effect

B:-Magnetic effect

C:-Chemical effect

D:-Gas ionization effect

Correct Answer:- Option-D

Question10:-Which type of resistor is used for arc quenching protection in circuit breakers?

A:-Varistors

B:-Sensistors

C:-Thermistors

D:-Light dependent resistor (LDR)

Correct Answer:- Option-A

Question11:-What is the shape of voltage wave form generated by a coil rotating in a uniform magnetic field?

A:-Sine wave

B:-Square wave

C:-Triangular wave

D:-Sawtooth wave

Correct Answer:- Option-A

Question12:-The time required to produce one complete cycle is called?

A:-Frequency of the wave form

B:-Form factor of the wave form

C:-Cycles per second of the wave form

D:-Period of the wave form

Correct Answer:- Option-D

Question13:-How inductance of a coil is decreased?

A:-By increasing no.of turns of the coil

B:-By increasing cross sectional area of core

C:-By increasing spacing between the turns

D:-By decreasing spacing between the turns

Correct Answer:- Option-C

Question14:-What is the capacitance of a capacitor that requires 0.5 coulomb to charge it to 50 volts?

A:-0.01 μ F

B:-0.01 F

C:-250 F

D:-25 μ F

Correct Answer:- Option-B

Question15:-In RLC series circuit, at which condition the current through the circuit is maximum?

A:- $R = X_L$

B:- $R = X_C$

C:- $X_L = X_C$

D:- $(X_L + X_C) = R$

Correct Answer:- Option-C

Question16:-At what condition the RLC parallel circuit behaves as capacitive circuits?

A:-Frequency is higher than resonance frequency

B:-Frequency is less than resonance frequency

C:-Frequency is equal to resonance frequency

D:-Frequency is zero

Correct Answer:- Option-A

Question17:-If the maximum value of dynamically induced emf produced in a conductor a DC generator is 100V, then what will be the value of induced emf when the conductor cuts the magnetic field at 30°?

A:-50 Volts

B:-100 Volts

C:-30 Volts

D:-86 Volts

Correct Answer:- Option-A

Question18:-What is the formula used to calculate the back emf of a DC motor?

A:- $E_b = V + I_a R_a$

B:- $E_b = V - I_a R_a$

C:- $E_b = V \times I_a R_a$

D:- $E_b = \frac{V}{I_a R_a}$

Correct Answer:- Option-B

Question19:-Which single phase A.C motor is classified under commutator type motor?

A:-Stepper motor

B:-Repulsion motor

C:-Shaded pole motor

D:-Permanent capacitor motor

Correct Answer:- Option-B

Question20:-A 3 phase 415 V, 60 Hz, 6 pole induction motor is running at 960 RPM. Calculate the rotor frequency?

A:-50 Hz

B:-6 Hz

C:-2 Hz

D:-12 Hz

Correct Answer:- Option-D

Question21:-A 2000/200 volt, 20 kVA, 50 Hz single phase transformer has 66 turns in secondary winding and 660 turns in primary winding. Calculate the primary current.

A:-100 A

B:-200 A

C:-10 A

D:-3 A

Correct Answer:- Option-C

Question22:-What is the purpose of providing explosion vent in power transformer?

A:-Air releasing

B:-Heat releasing

C:-Moisture releasing

D:-Pressure releasing

Correct Answer:- Option-D

Question23:-A wound type current transformer has 2 turns in primary and carry rated current of 100 ampere. What should be the no. of turns in secondary winding to circular a current of 5 ampere?

A:-40 turns

B:-250 turns

C:-20 turns

D:-50 turns

Correct Answer:- Option-A

Question24:-A 10 kVA, 2500/250 volt, 50 Hz transformer has the short circuit test power input of 256 watts and open circuit test power input of 225 watts. Calculate the load at which maximum efficiency occurs if the load power factor is 0.8 lagging?

A:-8.78 kVA

B:-7.5 kVA

C:-8 kVA

D:-10 kVA

Correct Answer:- Option-B

Question25:-At which position, the instrument is to be used which is provided with gravity control?

A:-Any position

B:-Inclined position

C:-Horizontal position

D:-Vertical position

Correct Answer:- Option-D

Question26:-If 1 mA current through a measuring instrument causes a full scale deflection of 1 volt. Then calculate the sensitivity of the instrument.

A:-1 ohm/volt

B:-1 volt/ohm

C:-1000 ohm/volt

D:-1000 volt/ohm

Correct Answer:- Option-C

Question27:-A 1 mA moving coil ammeter has a resistance of 27 Ω . Calculate the value of shunt resistance to be connected to extend its range to 10 mA ammeter?

A:-2.7 ohm

B:-3 ohm

C:-10 ohm

D:-270 ohm

Correct Answer:- Option-B

Question28:-Why the pointer of an insulation resistance tester is not coming back to initial position after the measurement is made?

A:-It is under damped

B:-It is over damped

C:-It does not have a controlling torque

D:-It does not have a deflecting torque

Correct Answer:- Option-C

Question29:-Which instrument has a uniform scale?

A:-Moving iron voltmeter

B:-Dynamometer type voltmeter

C:-Dynamometer type Ammeter

D:-Dynamometer type wattmeter

Correct Answer:- Option-D

Question30:-In the scale of a series type ohmmeter, on which zero reading is marked?

A:-On right side of scale

B:-On left side of scale

C:-At centre of scale

D:-It has no zero reading marking

Correct Answer:- Option-A

Question31:-Semiconductors have properties :

I. Resistivity less than insulator and more than a conductor.

II. Positive temperature co-efficient of resistance.

III. Conduction property can be changed by adding impurity.

A:-I and II are correct

B:-All three are correct

C:-II and III are correct

D:-I and III are correct

Correct Answer:- Option-D

Question32:-Which statement/s is/are true for Transistors?

I. Emitter supplies charge carriers.

- II. Emitter is always forward biased w.r.t Base so that it can supply large number of majority carriers.
- III. Collector is smaller than other two regions
- IV. Transistor transfers input signal current from a low-resistance circuit to high-resistance circuit.

A:-All are True

B:-I, II and IV are true

C:-I, II and III are true

D:-Only I and II are true

Correct Answer:- Option-B

Question33:-Select the false statement for a basic Zener voltage regulator:

A:-Zener is equivalent to a battery when it is in breakdown region

B:-Output voltage remains constant at V_z

C:-Irrespective of the changes in input voltage, current through Zener remains same

D:-Excess voltage is dropped across the series Resistance

Correct Answer:- Option-C

Question34:-In an oscillator tank circuit, frequency of oscillation is:

A:-inversely proportional to L and directly proportional to C

B:-inversely proportional to L and C

C:-directly proportional to L and C

D:-inversely proportional to C and directly proportional to L

Correct Answer:- Option-B

Question35:-For an RC phase shift oscillator circuit having three RC network sections, each section produces a phase shift of :

A:- 60°

B:- 120°

C:- 90°

D:- 180°

Correct Answer:- Option-A

Question36:-2's complement of binary "1000" is

A:-0111

B:-1000

C:-0110

D:-0101

Correct Answer:- Option-B

Question37:-According to De Morgan's theorem.

- I. NAND gate is equivalent to Bubbled OR gate
- II. NOR gate is equivalent to Bubbled AND gate.

III. NAND gate can be used as Inverter if both inputs are shorted.

A:-All are correct

B:-I and II are correct

C:-Only III is correct

D:-II and III are correct

Correct Answer:- Option-A

Question38:-Both the SUM and CARRY output for a full adder is 1 when :

A:-A = 1, B = 1, C = 0

B:-A = 0, B = 1, C = 0

C:-A = 1, B = 0, C = 0

D:-A = 1, B = 1, C = 1

Correct Answer:- Option-D

Question39:-Shifting in JK Flip-Flop is as follows :

I. To shift a 0 in to the flip-flop, J = 0 and K = 0

II. To shift a 1 in to the flip-flop J = 1 and K = 0

III. To toggle between 0 and 1, J = 1 and K = 1

A:-All the three are True

B:-Only III is True

C:-Only I and II are True

D:-Only II and III are True

Correct Answer:- Option-D

Question40:-DAC technique/s is/are

A:-Successive Approximation method

B:-Binary Ladder

C:-Resistive Divider

D:-Both (2) and (3)

Correct Answer:- Option-D

Question41:-Hex inverter IC is

A:-7400

B:-7404

C:-7408

D:-7411

Correct Answer:- Option-B

Question42:-A multiplexer of 4 control line having:

A:-8 data inputs and 1 output

B:-1 data input and 8 output lines

C:-16 data inputs and 1 output

D:-1 data input and 16 output lines

Correct Answer:- Option-C

Question43:-Electron Gun assembly in CRT consists of :

A:-Accelerating Anode

B:-Control Grid

C:-Vertical deflection plates

D:-Both (1) and (2)

Correct Answer:- Option-D

Question44:-Measurement which cannot be done with an Oscilloscope is

A:-Voltage Wave form

B:-Current through the circuit

C:-Time period

D:-Both (1) and (2)

Correct Answer:- Option-B

Question45:-In 8085 Flag Register, which bit position deal with carry flag?

A:-D0

B:-D2

C:-D4

D:-D6

Correct Answer:- Option-A

Question46:-The circuit in SMPS which adjust the duty cycle of the main switching transistors:

A:-EMI filter

B:-PWM controller

C:-Isolator

D:-Input rectifier

Correct Answer:- Option-B

Question47:-Function in Inverters are

I. Converts AC mains supply into DC and stores DC power in the battery.

II. When AC mains present, the input AC power is directly passes to output load through changeover relay.

III. DC power stored in the battery is converted into AC by the use of electronic circuits.

A:-Only I and II are true

B:-II and III only true

C:-Only I and III are True

D:-All three are True

Correct Answer:- Option-D

Question48:-The calculation of rejection by the Op-Amp of unwanted input signals common to both input leads is called :

A:-CMRR

B:-Gain

C:-Slew rate

D:-Integration

Correct Answer:- Option-A

Question49:-Ideal Op-Amp will have the following characteristics

I. Voltage gain $A_v = 1$

II. Bandwidth $BW = \infty$

III. Input resistance $R_{in} = \infty$

A:-Only I and II are True

B:-Only II and III are True

C:-Only I and III are True

D:-All three are true

Correct Answer:- Option-B

Question50:-The reference voltages at Threshold and Trigger comparators of 555 timer respectively are:

A:- $2/3 V_{cc}$ and $1/3 V_{cc}$

B:- $1/3 V_{cc}$ and $2/3 V_{cc}$

C:- $1/2 V_{cc}$ and $3/2 V_{cc}$

D:- $3/2 V_{cc}$ and $1/2 V_{cc}$

Correct Answer:- Option-A

Question51:-In measurement system, which of the following are undesirable static characteristics:

A:-Sensitivity and drift

B:-Static error and accuracy

C:-Drift, Static error and dead zone

D:-Reproducibility

Correct Answer:- Option-C

Question52:-Precision is the

A:-Degree of exactness

B:-Closeness of agreement among a number of consecutive measurements

C:-Ability to respond to true value of a measured variable

D:-None of the above

Correct Answer:- Option-A

Question53:-What is the name of instrument used to detect and record earthquake?

A:-Seismograph

B:-Stroboscope

C:-Megger

D:-AC tachometer

Correct Answer:- Option-A

Question54:-LVDT windings are wound on

A:-Steel sheets

B:-Aluminium

C:-Soft iron

D:-Copper

Correct Answer:- Option-C

Question55:-The polarity of DC tachometer output indicates

A:-polarity of connection to the electric circuit

B:-direction of rotation

C:-accuracy of tachometer

D:-speed of rotation

Correct Answer:- Option-B

Question56:-Which of the following conversion take place in bourdon tubes?

A:-Pressure to displacement

B:-Pressure to voltage

C:-Pressure to strain

D:-Pressure to force

Correct Answer:- Option-A

Question57:-In McLeod gauge,

A:-High pressure fluid is expanded to a low pressure which is read by the monometer technique

B:-Low pressure fluid is compressed to a high pressure which is read by the bourdon technique

C:-High pressure fluid is expanded to a low pressure which is read by the bourdon technique

D:-Low pressure fluid is compressed to a high pressure which is read by the monometer technique

Correct Answer:- Option-D

Question58:-Absolute pressure is equal to

A:-Atmospheric pressure + Gauge pressure

B:-Vacuum pressure - Atmospheric pressure

C:-Vacuum pressure + Atmospheric pressure

D:-Atmospheric pressure - Gauge pressure

Correct Answer:- Option-A

Question59:-The accuracy of dead weight tester is affected by

- I. Friction force between the piston and cylinder.
- II. Uncertainty of the value of affective area of the piston.
- III. Uncertainty of the value of gravitational constant.

A:-I and II

B:-II and III

C:-I, II and III

D:-I and III

Correct Answer:- Option-C

Question60:-What is the purpose of filling glycerin in gauge?

A:-Decrease pressure

B:-Reduce vibrations

C:-Increase pressure

D:-Improve accuracy

Correct Answer:- Option-B

Question61:-Choose the correct statement(s) regarding Ultrasonic flow meters.

- I. They offer no obstruction to the flow
- II. There are no moving parts
- III. They can be used for bidirectional flow

A:-I and II

B:-II and III

C:-I and III

D:-I, II and III

Correct Answer:- Option-D

Question62:-Which is the positive displacement flow meter?

A:-Variable area flow meter

B:-Turbine flow meter

C:-Nutating disc meter

D:-Venturi meter

Correct Answer:- Option-C

Question63:-Reynolds number

A:-Increases with increase in average velocity of liquid

B:-Decreases with increase in absolute viscosity of liquid

C:-Increases with increase in density of flowing liquid

D:-All of the above

Correct Answer:- Option-D

Question64:-The volume of fluid that is passing through a given cross sectional area

per unit time is

A:-volumetric flow rate

B:-density of flow

C:-volume of flow

D:-charge of flow

Correct Answer:- Option-A

Question65:-Rotameter is a

A:-variable head flow meter

B:-variable area flow meter

C:-positive displacement meter

D:-Mass flow meter

Correct Answer:- Option-B

Question66:-The primary conversion takes place in float type level indicator is

A:-Level to pressure

B:-Voltage to level

C:-Level to displacement

D:-Level to force

Correct Answer:- Option-C

Question67:-Which of the following is direct method of level measurement?

A:-Sight glass system

B:-Air purge

C:-Ultrasonic level detector

D:-Radar level sensor

Correct Answer:- Option-A

Question68:-Which of the following instruments is used to measure flow on the application of Bernoulli's equation?

A:-Venturimeter

B:-Orifice plate

C:-Pitot tube

D:-All of the above

Correct Answer:- Option-D

Question69:-Which one of the following measures the flow in open channels?

A:-Weirs

B:-Orifice plate

C:-Pitot tube

D:-None of the above

Correct Answer:- Option-A

Question70:-Which system works with sound waves for measuring liquid level?

A:-Radar Level detector

B:-Ultrasonic level detector

C:-Displacer level detector

D:-Rotameter

Correct Answer:- Option-B

Question71:-On the Kelvin temperature scale, the steam point is

A:-383.15°K

B:-373.15°K

C:-373°K

D:-273°K

Correct Answer:- Option-B

Question72:-In a Bimetallic thermometer, the material of the thermal well may be

A:-Brass

B:-Steel

C:-Stainless steel

D:-All of the above

Correct Answer:- Option-D

Question73:-In a liquid-in-metal thermometer, the bourdon tube, the bulb and capillary tube are completely filled with mercury, usually at a _____ pressure.

A:-lower

B:-higher

C:-may be higher or lower

D:-none

Correct Answer:- Option-B

Question74:-RTD is used to determine the temperature by measuring the _____ of a electrical wire.

A:-Conductance

B:-Resistance

C:-Voltage

D:-Capacitance

Correct Answer:- Option-B

Question75:-ISA type designation of chromel - Alumel thermocouple

A:-E

B:-J

C:-K

D:-T

Correct Answer:- Option-C

Question76:-Optical pyrometer measures the temperature range in between

A:-600° to 3000°C

B:-400°C to 3000°C

C:-600°C to 4000°C

D:-600° to 3500°C

Correct Answer:- Option-A

Question77:-Thermistors are

A:-Conductors

B:-Semi conductors

C:-Insulators

D:-Special type resistors

Correct Answer:- Option-B

Question78:-_____ valves are not suitable for throttling volume.

A:-Butterfly

B:-Globe

C:-Cage

D:-Gate

Correct Answer:- Option-D

Question79:-In a _____ increase in the pneumatic pressure applied to the diaphragm lifts the valve stem.

A:-Direct acting actuator

B:-Reverse acting Actuator

C:-Both (1) and (2)

D:-None

Correct Answer:- Option-B

Question80:-_____ switch is one detecting the closeness of some object.

A:-IR

B:-Micro

C:-Proximity

D:-Limit

Correct Answer:- Option-C

Question81:-The standard electrical signal in instrumentation

A:-6-20 mA

B:-5-10 V

C:-4-20 mA

D:-0-20 mA

Correct Answer:- Option-C

Question82:-_____ is to correct the error between the controlled output and its desired value corresponding to the reference value.

A:-Feed forward control

B:-Feed back control

C:-Open loop control

D:-Cascade control

Correct Answer:- Option-B

Question83:-In _____ control system use's a secondary controller.

A:-Open

B:-Closed loop

C:-Ratio

D:-Cascade

Correct Answer:- Option-D

Question84:-Offset in the proportional controller can be eliminated by using along with

A:-Derivative control action

B:-Integral Control action

C:-Both (1) and (2)

D:-None

Correct Answer:- Option-B

Question85:-_____ control system is typically used in the Industrial applications.

A:-Cascade

B:-Feed forward

C:-Ratio

D:-Feed back

Correct Answer:- Option-C

Question86:-Programmable logic controllers performs the functions

A:-Discrete or continuous control functions

B:-Producing ON-OFF voltage outputs

C:-Actuating elements such as electric motors, solenoids etc

D:-All of the above

Correct Answer:- Option-D

Question87:-In HART protocol _____ standard to super impose the digital communication.

A:-Bell 202 FSK

B:-PWM

C:-PCM

D:-None

Correct Answer:- Option-A

Question88:-HART stands for

A:-High way Addressable Remote Transmitter

B:-High way Addressable Remote Transducer

C:-High way Addressable Remote Transformer

D:-High way Addressing Remote Transducer

Correct Answer:- Option-B

Question89:-_____ is an input device of PLC.

A:-Relay

B:-Lights

C:-Pushbutton

D:-Motor

Correct Answer:- Option-C

Question90:-In ladder logic, the given symbol is used to indicate



A:-Fuse

B:-Heating element

C:-Relay Coil

D:-Flow switch

Correct Answer:- Option-B

Question91:-_____ cable has greater transmission capacity.

A:-Twisted pair

B:-Co-axial cable

C:-Fiber optic

D:-Both (1) and (2)

Correct Answer:- Option-C

Question92:-LAN is useful for small distance communication

A:-Upto 2 kms

B:-Upto 5 kms

C:-Upto 3 kms

D:-Upto 10 kms

Correct Answer:- Option-B

Question93:-In which network topology has a central node connected to each node?

A:-Bus

B:-Ring

C:-Star

D:-Mesh

Correct Answer:- Option-C

Question94:-_____ is a German standard.

A:-FIP Bus

B:-PROFI Bus

C:-MOD Bus

D:-Rack Bus

Correct Answer:- Option-B

Question95:-PWM is also called

A:-Pulse Position Modulation

B:-Pulse Code Modulation

C:-Pulse Duration Modulation

D:-Pulse Frequency Modulation

Correct Answer:- Option-C

Question96:-In DCS, sensors are in the _____ level.

A:-Zero

B:-One

C:-Two

D:-Three

Correct Answer:- Option-A

Question97:-_____ do not collect and record information or connect to the databases.

A:-SCADA

B:-HMI

C:-PLC

D:-DCS

Correct Answer:- Option-B

Question98:-_____ instrument used to measure hydrogen ion activity in solutions.

A:-Hydrometer

B:-Hygrometer

C:-Conductivity meter

D:-pH meter

Correct Answer:- Option-D

Question99:-The types of control typically needed by the batch process is

A:-Regulatory

B:-Sequential

C:-Discrete

D:-All of them

Correct Answer:- Option-B

Question100:-A technical office protocol was defined by

A:-General motors

B:-Boeing

C:-Digital

D:-IBM

Correct Answer:- Option-B