

PROVISIONAL ANSWER KEY

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Alphacode	A

Question1:-The eigen values of 4×4 matrix [A] are given by 2, 3, 5 and 7. Then the value of the determinant of the matrix [A] is

- A:-179
- B:-210
- C:-15
- D:-120

Correct Answer:- Option-B

Question2:-If $u = \log \left[\frac{x^6 + y^5}{x^2 + y^3} \right]$ then the value of $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$ is

- A:-6
- B:-5
- C:-4
- D:-3

Correct Answer:- Option-D

Question3:-For the function $f(z) = \frac{\sin z}{z^4}$ of a complex variable z , the point $z = 0$ is

- A:-a pole of order 4
- B:-a pole of order 3
- C:-a pole of order 2
- D:-not a singularity

Correct Answer:- Option-B

Question4:-Let $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ and $r = |\vec{r}|$ then $\nabla \log r$ is

- A:- $\frac{1}{r^2} \vec{r}$
- B:- $\frac{\log r}{r} \vec{r}$
- C:- $\frac{1}{r} \vec{r}$
- D:- \vec{r}

Correct Answer:- Option-A

Question5:-Particular integral of $(D^2 - 3D + 2)y = e^{2x}$ is

- A:- e^{2x}
- B:- $\frac{1}{4}e^{2x}$
- C:- xe^{2x}
- D:- x^2e^{2x}

Correct Answer:- Option-C

Question6:-The resultant of two concurrent coplanar forces of equal magnitude P each making an angle of 90° is given by

- A:- $2P$
- B:- $\sqrt{2}P$
- C:- $2\sqrt{P}$
- D:- P

Correct Answer:- Option-B

Question7:-The necessary condition for equilibrium of a set of coplanar non-concurrent forces are

- A:- $\sum H = 0$

B:- $\Sigma H = 0, \Sigma V = 0$

C:- $\Sigma V = 0, \Sigma M = 0$

D:- $\Sigma H = 0, \Sigma V = 0, \Sigma M = 0$

Correct Answer:- Option-D

Question8:-The point of contraflexure in a beam is the point where

A:-Bending moment is maximum

B:-Bending moment and shear force both are either zero or change sign

C:-Only bending moment is zero or changes sign

D:-Bending moment is minimum

Correct Answer:- Option-C

Question9:-The following ingredient impart quick setting property to cement

A:-Alumina

B:-Silica

C:-Lime

D:-Magnesia

Correct Answer:- Option-A

Question10:-The height of instrument in levelling is defined as

A:-Height of the telescope from ground

B:-Height of line of collimation from ground

C:-Reduced level of line of collimation

D:-Reduced level of instrument station

Correct Answer:- Option-C

Question11:-For a Francis Turbine, the flow ratio, K_f ranges from

A:-.1 to .45

B:-.6 to .9

C:-.98 to 1

D:-1 to 1.3

Correct Answer:- Option-A

Question12:-Which one is a path function ? (i) Enthalpy (ii) Entropy (iii) Specific heat

A:-Only (i)

B:-Only (ii)

C:-Only (iii)

D:- (i) and (ii)

Correct Answer:- Option-A

Question13:-Negative slip in a reciprocating pump can be due to

A:-Long suction pipe

B:-Long discharge pipe

C:-Overload

D:-Low belt tension

Correct Answer:- Option-A

Question14:-In the turning of cast iron with HSS tool, type of chip formed is (i) Continuous (ii) Continuous with built up edge (iii) Segmental

A:-Only (i) is true

B:-Only (ii) is true

C:-Only (iii) is true

D:- (i) and (ii) are true

Correct Answer:- Option-C

Question15:-In carbon arc welding

A:-Carbon is negative electrode

B:-Work is negative

C:-No electrodes

D:-1 and 2 possible

Correct Answer:- Option-A

Question16:-A 10 V battery is connected to a 5 A current source (Current enters at the positive terminal of the battery). Power absorbed by the battery and the current source are

A:-50 W, 50 W

B:-50 W, -50 W

C:-50 W, -50 W

D:-50 W, 50 W

Correct Answer:- Option-B

Question17:-Form factor of full rectified sinusoidal voltage is

A:-1.414

B:-1.11

C:-1

D:-1.714

Correct Answer:- Option-B

Question18:-A 10 KVA, 2500/250 V single phase transformer has the test results as

O.C Test : 250 V, 0.8 A, 50 W

S.C. Test : 60 V, 3 A, 45 W : Load KVA at maximum efficiency is

A:-10 KVA

B:-50 KVA

C:-5 KVA

D:-6.25 KVA

Correct Answer:- Option-D

Question19:-A 7 KW, 400 V, three phase 50 Hz., 6 pole squirrel cage induction motor operates at 5% slip at full load, when rated voltage at rated frequency is applied. Assuming linear T-S characteristics, No load speed (for torque 6 Nm) at half the rated voltage and rated frequency is

A:-1000

B:-737

C:-983

D:-1474

Correct Answer:- Option-C

Question20:-For a synchronous motor, the counter e.m.f. E_b in magnitude will be

A:-Less than the applied terminal voltage

B:-Equals the applied terminal voltage

C:-More than the applied terminal voltage

D:-Either less than or equal to or more than the applied terminal voltage

Correct Answer:- Option-D

Question21:-A conducting diode is reverse biased at time $t = T_1$. A measurement of current through the diode is made at three different time instants along the positive time axis at $t = T_1$, T_2 and T_3 . Select the correct statement about the diode current.

A:-The current drops to zero at time $t = T_1$ and continues as such at $t = T_2$ and $t = T_3$

B:-The current reverses at $t = T_1$ and reaches the reverse saturation current at time $t = T_2$ where the interval T_1 to T_2 is called the transition time

C:-The current drops to reverse saturation current at $t = T_1$ and continues as such at time $t = T_2$ and $t = T_3$ where the interval T_1 to T_2 is called the storage time

D:-The current reverses at $t = T_1$ and continues as such till $t = T_2$ and then reaches the reverse saturation current at time $t = T_3$ where the interval T_2 to T_3 is called the transition time

Correct Answer:- Option-D

Question22:-Assume a half-wave rectifier that uses a transformer with maximum voltage V_m . The peak inverse voltages of the half-wave rectifier with and without a capacitor filter are _____ and _____ respectively.

A:- V_m , V_m

B:- V_m , $2V_m$

C:- $2V_m$, V_m

D:- $2V_m$, $2V_m$

Correct Answer:- Option-C

Question23:-A transistor used as an emitter follower has

- A:-Voltage gain close to unity, high input resistance, low output resistance, 180 degree phase shift between input and output
- B:-Current gain close to unity, high input resistance, low output resistance, 180 degree phase shift between input and output
- C:-Voltage gain close to unity, high input resistance, low output resistance, 0 degree phase shift between input and output
- D:-Voltage gain close to unity, high input resistance, high output resistance, 0 degree phase shift between input and output

Correct Answer:- Option-C

Question24:-A Wien bridge oscillator circuit with an operational amplifier as the active element has a resistor R_1 connected from the opamp output terminal to inverting input terminal and a resistor R_2 connected from the inverting input terminal to ground. Assume R_1 and R_2 are selected to meet the conditions for oscillation. The amplitude of oscillation can be stabilised by

- A:-Using a sensistor as R_2
- B:-Using a thermistor as R_2
- C:-Using a sensistor as R_1
- D:-Using sensistor as R_1 and thermistor as R_2

Correct Answer:- Option-A

Question25:-Assume we need to ensure at least 50 cycles of carrier in Amplitude Modulation (AM) for an audio signal with spectrum extending from 20 Hz to 20 kHz. The AM radio carrier can be selected to have a typical value of

- A:-100 kHz
- B:-1000 kHz
- C:-2.5 kHz
- D:-1 kHz

Correct Answer:- Option-B

Question26:-Which of the following constitutes the central processing unit of a computer ?

- A:-Control Unit, Arithmetic Logic Unit
- B:-Keyboard, Mouse and Screen
- C:-RAM, Hard disk and Cache
- D:-Interconnection Network and Cables

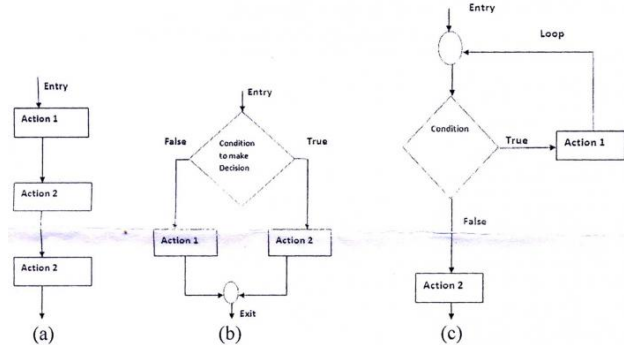
Correct Answer:- Option-A

Question27:-The data used for computer processing is usually represented in a particular format. Which of the following is the format used ?

- A:-Binary Coded Decimal
- B:-Binary
- C:-Hexadecimal
- D:-Decimal

Correct Answer:- Option-A

Question28:-Which of the following represents a Loop structure in C ?



- A:-Only (c)
- B:-Only (b)
- C:-Both (a) and (b)
- D:-Both (b) and (c)

Correct Answer:- Option-A

Question29:-What is the output of the following code ?

```
void main()
{
  int i, j;
```

```
for(i=1;<=10;i++);
for(j=1;j<=10;j++)
printf("%d\n",i+j);
}
```

A:-12 to 21

B:-11

C:-22

D:-2 to 11

Correct Answer:- Option-A

Question30:-What is the output of the following code ?

```
#include <stdio.h>
int fact(int);
void main()
{
    int sum;
    sum=fact(1)/2+fact(2)/3+fact(3)/4+fact(4)/5+fact(5)/6;
    printf("The sum of the series is : %d\n",sum);
}
int fact(int n)
{
    int num=0,f=1;
    while(num<=n-1)
    {
        f=f*f*num;
        num++;
    }
    return f;
}
```

A:-120

B:-34

C:-153

D:-25

Correct Answer:- Option-D

Question31:-The vertical passage through which the molten metal flows downward is called

A:-Pouring basin

B:-Sprue

C:-Runner

D:-Gates

Correct Answer:- Option-B

Question32:-The metallic objects of high heat capacity and high thermal conductivity which are placed in the mold is termed as

A:-Riser

B:-Core

C:-Chills

D:-Vents

Correct Answer:- Option-C

Question33:-The pattern used for the mass production of small castings is

A:-Split pattern

B:-Sweep pattern

C:-Solid pattern

D:-Gated pattern

Correct Answer:- Option-D

Question34:-The tapering of the sides of the pattern is known as ____ allowance.

A:-Draft

B:-Machining

C:-Distortion

D:-Shake

Correct Answer:- Option-A

Question35:-The defect that occurs on the flat surface of a casting due to the thermal expansion of moulding sand is termed as

- A:-Scar
- B:-Wash
- C:-Blows
- D:-Scabs

Correct Answer:- Option-D

Question36:-The defect caused by the enlargement of the mould cavity after the metal has been poured is

- A:-Buckle
- B:-Swell
- C:-Core shift
- D:-Hot tears

Correct Answer:- Option-B

Question37:-A chaplet is used to

- A:-Create void in the casting
- B:-Withdraw the pattern from a mould
- C:-Support the core
- D:-Act as a reservoir of molten metal

Correct Answer:- Option-C

Question38:-Investment casting method is used when the size of the casting is _____ in size.

- A:-large
- B:-medium
- C:-small
- D:-small with intricate shape

Correct Answer:- Option-D

Question39:-Railway rails are repaired by which of the following welding method ?

- A:-Thermit welding
- B:-Arc welding
- C:-TIG welding
- D:-Resistance welding

Correct Answer:- Option-A

Question40:-Which among the following welding process is not a fusion process ?

- A:-Gas welding
- B:-Resistance welding
- C:-Arc welding
- D:-Thermit welding

Correct Answer:- Option-B

Question41:-Light aluminium sheets are joined by

- A:-TIG welding
- B:-MIG welding
- C:-Resistance welding
- D:-Gas welding

Correct Answer:- Option-A

Question42:-Presence of sulphur in the welded joint increases its

- A:-Toughness
- B:-Brittleness
- C:-Ductility
- D:-Strength

Correct Answer:- Option-B

Question43:-Carburizing gas flame is due to the excess presence of

- A:-Ethylene

B:-Propylene

C:-Acetylene

D:-Methylene

Correct Answer:- Option-C

Question44:-Which of the following forging operation is also known as precision forging ?

A:-Open-die forging

B:-Impression die forging

C:-Roll forging

D:-Flashless forging

Correct Answer:- Option-D

Question45:-The main body of the cutting tool is termed as

A:-Flank

B:-Rake

C:-Heel

D:-Shank

Correct Answer:- Option-D

Question46:- ____ forms the surface below and adjacent to the cutting edge.

A:-Flank

B:-Nose

C:-Heel

D:-Shank

Correct Answer:- Option-A

Question47:-A tool signature of a single point cutting tool consists of _____ numbers of angles and a nose radius.

A:-3

B:-4

C:-6

D:-9

Correct Answer:- Option-C

Question48:-Continuous chips are produced while machining _____ materials with carbide tools operating at higher cutting speeds.

A:-Brittle

B:-Ductile

C:-Hard

D:-Sonorous

Correct Answer:- Option-B

Question49:-Feed is expressed in the unit as _____ in lathe turning operation.

A:-mm/stroke

B:-mm/sec

C:-mm/minute

D:-mm/revolution

Correct Answer:- Option-D

Question50:-Taylor's tool life equation is

A:- $V^n T = C$

B:- $V T^n = C$

C:- $(VT)^n = C$

D:- $2VT^n = C$

Correct Answer:- Option-B

Question51:-Which among the following process is a chipless operation ?

A:-Boring

B:-Reaming

C:-Lapping

D:-Knurling

Correct Answer:- Option-D

Question52:-Which among the following is least hard abrasive ?

A:-Aluminium oxide

B:-Cubic boron nitride

C:-Aluminium oxalate

D:-Diamond

Correct Answer:- Option-A

Question53:-Major component of ceramic tool is

A:-Chromium oxide

B:-Titanium

C:-Magnesium

D:-Aluminium oxide

Correct Answer:- Option-D

Question54:-CBN stands for

A:-Carbon Boron Nitrogen

B:-Cubic Boron Nitride

C:-Carbon Bromine Nitrate

D:-Carbon Berrillium Nitride

Correct Answer:- Option-B

Question55:-Which among the following part is not associated with an engine lathe ?

A:-Saddle

B:-Arbor

C:-Apron

D:-Spindle

Correct Answer:- Option-B

Question56:-The time (t) required for machining a workpiece of length 'L' mm in engine lathe is calculated by the formulae _____ (where s = feed, n = speed).

A:- $\frac{L}{n}$

B:- $\frac{L}{t \times n}$

C:- $\frac{L}{s}$

D:- $\frac{L}{s \times n}$

Correct Answer:- Option-D

Question57:-Whitworth's quick return motion mechanism is associated with _____ machine.

A:-Milling

B:-Drilling

C:-Shaping

D:-Surface grinding

Correct Answer:- Option-C

Question58:-Which among the following process required vacuum for the machining action ?

A:-Laser beam machining

B:-Electric discharge machining

C:-Electron beam machining

D:-Electro chemical machining

Correct Answer:- Option-C

Question59:-An ideal _____ system applies computer technology to all the operational functions and information processing functions in manufacturing.

A:-CAD

B:-CAM

C:-FMS

D:-CIM

Correct Answer:- Option-D

Question60:-When dynamism is introduced for digital mock-up technology, it becomes

A:-Virtual engineering

B:-Virtual prototyping

C:-Virtual motion study

D:-Animation

Correct Answer:- Option-B

Question61:-The input for the rapid prototyping is

A:-A prototype

B:-Animated model

C:-Rough dimension model

D:-CAD model

Correct Answer:- Option-D

Question62:-Which among the following is not a powder based rapid prototyping process ?

A:-Fused deposition modelling

B:-3-D printing

C:-Selective laser sintering

D:-Injection moulding

Correct Answer:- Option-A

Question63:-Which word is used to identify the block in NC machines ?

A:-B - word

B:-C - word

C:-G - word

D:-N - word

Correct Answer:- Option-D

Question64:-Which among the following word is used to prepare the controlling unit for the operating instructions ?

A:-B - word

B:-C - word

C:-G - word

D:-N - word

Correct Answer:- Option-C

Question65:-NC machine tools falls under the category of

A:-Transfer lines

B:-Flexible automation

C:-Hard automation

D:-Soft automation

Correct Answer:- Option-B

Question66:-The purpose of T-word in a block is to specify

A:-Torque

B:-Tool selection

C:-Feed selection

D:-Coolant selection

Correct Answer:- Option-B

Question67:-When specifying the axes of a CNC machine tool, the spindle axis is considered as

A:-X - axis

B:-Y - axis

C:-Z - axis

D:-XY - axis

Correct Answer:- Option-C

Question68:-Programmable automation is suitable for

- A:-Low production volumes and large part varieties
- B:-Low production volumes and small part varieties
- C:-High production volumes and small part varieties
- D:-High production volumes and large part varieties

Correct Answer:- Option-D

Question69:-Which of the following method is used to form part families ?

- A:-Visual inspection
- B:-Production flow analysis
- C:-Classification and coding
- D:-Process flow analysis

Correct Answer:- Option-C

Question70:-In optiz code, the form code consists of

- A:-8-digits
- B:-9-digits
- C:-5-digits
- D:-18-digits

Correct Answer:- Option-C

Question71:-Cellular manufacturing uses the information of

- A:-Part-machine incidence matrix
- B:-Parts classification and coding
- C:-Machine tool types
- D:-Cell design issues

Correct Answer:- Option-B

Question72:-A group of closely located workstations where multiple sequence of operations are performed is known as

- A:-Group technology
- B:-Computed aided process plan
- C:-Machine cell
- D:-Flexible manufacturing system

Correct Answer:- Option-C

Question73:-The number of instantaneous centres of rotation for a six link mechanism is

- A:-6
- B:-4
- C:-12
- D:-15

Correct Answer:- Option-D

Question74:-The angle at any point in the pitch curve of the cam included between the normal to that point on the curve and line of motion of the follower at that instant is known as

- A:-Cam angle
- B:-Profile angle
- C:-Pressure angle
- D:-Dwell angle

Correct Answer:- Option-C

Question75:-For spring controlled governors, the controlling force curve would be

- A:-Straight line
- B:-Circle
- C:-Parabola
- D:-Hyperbola

Correct Answer:- Option-A

Question76:-The ratio of number of teeth to the pitch circle diameter is called

- A:-Circular pitch
- B:-Diametral pitch
- C:-Module
- D:-Addendum

Correct Answer:- Option-B

Question77:-In a critically damped vibrating system with single degree of freedom, the damping factor should be equal to

- A:-0
- B:-1
- C:-<1
- D:->1

Correct Answer:- Option-B

Question78:-The primary unbalanced force in reciprocating masses is

- A:-Directly proportional to the crank radius
- B:-Directly proportional to the square of crank radius
- C:-Inversely proportional to the crank radius
- D:-Independent of crank radius

Correct Answer:- Option-A

Question79:-The first standard evolved in Great Britain to standardise limits and fits is

- A:-Newall system
- B:-Unilateral system
- C:-Bilateral system
- D:-ISO system

Correct Answer:- Option-A

Question80:-Which among the following fit is a transition fit ?

- A:-Shrinkage fit
- B:-Forced fit
- C:-Driving fit
- D:-Push fit

Correct Answer:- Option-D

Question81:-Repeatability of a measuring process is

- A:-Precision
- B:-Sensitivity
- C:-Accuracy
- D:-Interchangeability

Correct Answer:- Option-A

Question82:-The process of making the slip gauge blocks adhere is called

- A:-Bonding
- B:-Flattening
- C:-Knurling
- D:-Wringing

Correct Answer:- Option-D

Question83:-Which among the following is not a mechanical comparator ?

- A:-Dial indicator
- B:-Sigma comparator
- C:-Johansson mikrokrator
- D:-Zeiss optimeter

Correct Answer:- Option-D

Question84:-Irregularities caused due to vibrations of any kind such as chatter marks are classified under

- A:-First order
- B:-Second order

C:-Third order

D:-Fourth order

Correct Answer:- Option-B

Question85:-The principle behind the operation of which instrument is based on trigonometry

A:-Comparators

B:-Slip gauges

C:-Optical flat

D:-Sine bar

Correct Answer:- Option-D

Question86:-Which among the following is not the component of surface texture ?

A:-Roughness

B:-Flatness

C:-Waviness

D:-Lay

Correct Answer:- Option-B

Question87:-Who's work in the field of scientific management led to the science of ergonomics and industrial psychology ?

A:-F.W. Taylor

B:-H. Gantt

C:-Gilbreth

D:-Henry Fayol

Correct Answer:- Option-C

Question88:-The tool that provides a visual representation of what occurs over the course of a project is

A:-PERT

B:-CPM

C:-Control chart

D:-Gantt chart

Correct Answer:- Option-D

Question89:-The chart which indicates the closeness of the pairs of department, depending upon the activities is

A:-Control chart

B:-REL chart

C:-Travel chart

D:-Gantt chart

Correct Answer:- Option-B

Question90:-A chart in which therbligs are used for operators movements of left and right hand is

A:-SIMO chart

B:-REL chart

C:-Process chart

D:-Gantt chart

Correct Answer:- Option-A

Question91:-Which among the following is an example for the control charts for attributes ?

A:- \bar{X} - chart

B:-R-chart

C:- σ chart

D:-p-chart

Correct Answer:- Option-D

Question92:-Process capability is represented as

A:- 2σ

B:- $3\sigma'$

C:- 4σ

D:- $6\sigma'$

Correct Answer:- Option-D

Question93:-Which among the following is an example for the control chart for variables ?

- A:-p-chart
- B:-R-chart
- C:-C-chart
- D:-U-chart

Correct Answer:- Option-B

Question94:-'Crashing' is the term associated with

- A:-Inventory control
- B:-Process control
- C:-Method study
- D:-Network analysis

Correct Answer:- Option-D

Question95:-Hungarian algorithm is associated with _____ problems.

- A:-Transportation
- B:-Assignment
- C:-Sequencing
- D:-Scheduling

Correct Answer:- Option-B

Question96:-Six sigma values denotes the _____ in statistical quality control.

- A:-Process capability
- B:-Product life
- C:-Product consumption
- D:-Process validity

Correct Answer:- Option-A

Question97:-Which among the following term is not connected with the events in network analysis ?

- A:-Merge
- B:-Burst
- C:-End
- D:-Dummy

Correct Answer:- Option-D

Question98:-Critical path method of project network analysis is _____ method.

- A:-Activity oriented
- B:-Process oriented
- C:-Event oriented
- D:-Money oriented

Correct Answer:- Option-A

Question99:-PERT network analysis is most suitable for the projects like

- A:-Maintenance activity
- B:-Construction activity
- C:-Assembling process
- D:-Research and development

Correct Answer:- Option-D

Question100:-The term 'lead time' is associated with _____ management.

- A:-Project
- B:-Quality
- C:-Inventory
- D:-Human resource

Correct Answer:- Option-C