FINAL ANSWER KEY

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Question1:-The arterial roads of a state connecting up with National Highways of adjacent state, district headquarters, important cities in the state serving as main arteries for traffic to and from districts is called

A:-National Highways

B:-State Highways

C:-Major District Roads

D:-Other District Roads

Correct Answer:- Option-B

Question2:-Institutional buildings are under the category of _____ as per NBC.

A:-Group A

B:-Group B

C:-Group C

D:-Group D

Correct Answer:- Option-C

Question3:-The space covered by the floor of the property, along with the area covered by its internal and external walls is called

A:-Plinth Area

B:-Floor Area

C:-Carpet Area

D:-None of these

Correct Answer:- Option-A

Question4:-Soil material which is derived from rock bedding and has not undergone transportation is called

A:-Residual soil

B:-Till

C:-Loess

D:-Talus

Correct Answer:- Option-A

Question5:-Symons Rain gauge comes under

A:-Non recording type Rain Gauge

B:-Recording Type Rain Gauge

C:-Both 1 and 2

D:-None of the above

Correct Answer:- Option-A

Question6:-Marble is an example of

A:-Igneous Rock

B:-Sedimentary Rock

C:-Metamorphic Rock

D:-None of the above

Correct Answer:- Option-C

Question7:-Yellowish or red stains in timber due to over maturity and insufficient ventilation during storage is due to

A:-Twisting and Bowing

B:-Foxiness

C:-Case Hardening

D:-Collapse

Correct Answer:- Option-B

Question8:-The mix proportion of M10 concrete is

A:-1 : 1.5 : 3

B:-1 : 1 : 2

C:-1 : 3 : 6

D:-1 : 2 : 4

Correct Answer:- Option-C

Question9:-Wrought iron is manufactured from

A:-Reverbaratory furnace

B:-Cupola furnace

C:-Bessemer process

D:-None of the above

Correct Answer:- Option-A

Question10:-The specific gravity of plastic is

A:-0.3 to 0.4

B:-1.3 to 1.4

C:-2.3 to 2.7

D:-0.5 to 1.0

Correct Answer:- Option-B

Question11:-Alternate courses of stretchers and headers are laid in

A:-Header bond

B:-Stretcher bond

C:-English bond

D:-Flemish bond

Correct Answer:- Option-C

Question12:-The vertical distance between wall plate and top of ridge is called

A:-Eaves

B:-Rise

C:-Pitch

D:-Valley

Correct Answer:- Option-B

Question13:-The speed of lift car upto 4 floors is

A:-0.5 m/s

B:-0.5 to 0.75 m/s

C:-0.75 to 1.5 m/s

D:-1.5 to 2 m/s

Correct Answer:- Option-B

Question14:-The diameter of under reamed piles is normally

A:-2 times the diameter of pile stem

B:-2.5 times the diameter of pile stem

C:-3 times the diameter of pile stem

D:-5 times the diameter of pile stem

Correct Answer:- Option-B

Question15:-Foundation is provided to

A:-Provide level and uniform base to superstructure

B:-Distribute load of the structure on a large area

C:-Provide good anchorage imparting stability to superstructure to prevent overhanging

D:-All of the above

Correct Answer:- Option-D

Question16:-Carnot cycle consists of the processes

A:-Two reversible isotherms and two reversible adiabatics

B:-Two reversible isotherms and two isobarics

C:-Two reversible isotherms and two isochores

D:-Two isentropic and two isochores

Correct Answer:- Option-A

Question17:-Efficiency of the Otto cycle is a function of

A:-Temperature levels at which the cycle operates

B:-Compression ratio only

C:-Both 1 and 2

D:-None of these

Correct Answer:- Option-B

Question18:-In a thermodynamic cycle if the energy is released by combustion of fuel party at constant volume and partly at constant pressure is

A:-Constant volume cycle

B:-Constant pressure cycle

C:-Limited pressure cycle

D:-None of these

Correct Answer:- Option-C

Question19:-Network done in a reciprocating IC engine is

A:-m.e.p × displacement volume

B:-m.e.p/displacement volume

C:-displacement volume/m.e.p

D:-none of these

Correct Answer:- Option-A

Question20:-In an IC engine mechanical efficiency is

A:-BP/IP

B:-BMEP/IMEP

C:-Brake thermal efficiency/Indicated thermal efficiency

D:-1, 2 and 3 are correct

Correct Answer:- Option-D

Question21:-In a vapour compression refrigeration system wet compression causes

i. No cylinder head damage
ii. Cylinder wear

A:-(i) is correct (ii) is wrong

B:-(i) is wrong (ii) is correct

C:-(i) and (ii) are wrong

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

Correct Answer:- Option-B

Question22:-If the wet bulb depression is zero then

i. Ambient air is saturated and RH is 100%
ii. WBT and DBT are equal

A:-(i) is correct and (ii) is wrong

B:-(i) and (ii) are wrong

C:-(i) and (ii) are correct

D:-(i) is wrong and (ii) is correct

Correct Answer:- Option-C

Question23:-By fitting air vessel to the reciprocating pump
i. Discharge of the water can be made uniform.
ii. Pump can be run at high speed.
iii. Work done in overcoming the frictional resistance in the suction and delivery pipes can be reduced.

A:-(i) and (ii) are correct and (iii) is wrong

B:-(i), (ii) and (iii) are correct

C:-(i) and (ii) are wrong and (iii) is correct

D:-(i) is correct and (ii) and (iii) are wrong

Correct Answer:- Option-B

Question24:-In a centrifugal pump ratio of impeller power to the prime mover power is

A:-Manometric efficiency

B:-Mechanical efficiency

C:-Overall efficiency

D:-None of these

Correct Answer:- Option-B

Question25:-In a belt transmission when the centrifugal tension is taken into account

A:-Total tension in the tight side will increase

B:-Total tension in the slack side will decrease

C:-Both 1 and 2 are correct

D:-1 is correct 2 is wrong

Correct Answer:- Option-D

Question26:-Instead of natural clay silica grains are coated with sodium silicate in

A:-Shell sand

B:-CO_2 sand

C:-Facing sand

D:-Loam sand

Correct Answer:- Option-B

Question27:-In a mould to trap heavier and lighter impurities flowing towards the casting provide

A:-Padding

B:-Riser

C:-Skim bob

D:-Sprue

Correct Answer:- Option-C

Question28:-Welded portion should be peened with a hammer

i. To remove surface oxides and residual flux present on weld surface.
ii. To provide compressive stress on the weld surface.
iii. To provide tension on the weld surface.

A:-Statements (i) and (ii) are correct and (iii) is wrong

B:-Statements (i) and (iii) are correct and (ii) is wrong

C:-Only statement (i) is correct

D:-Welded portion should not be peened with a hammer

Correct Answer:- Option-A

Question29:-In a lathe for holding and obtaining a hollow piece of work that has been previously drilled or bored

A:-Face plate can be used

B:-Mandrel can be used

C:-Collets can be used

D:-Steady rest can be used

Correct Answer:- Option-B

Question30:-To drill a hole in the metals like copper and stainless steel, point angle used in the twist drill is

A:-80º

B:-118º

C:-140º

D:-100º

Correct Answer:- Option-C

Question31:-Three 1 ohm resistors are connected to form a triangle. The resistance between any two corners is

A:-2 Ω

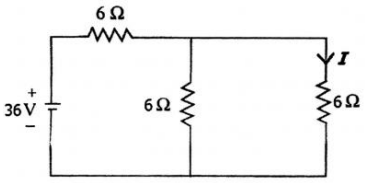
B:-3 Ω

C:-2/3 Ω

D:-3/2 Ω

Correct Answer:- Option-C

Question32:-For the following circuit, the current I is



A:-1A

B:-2A

C:-3A

D:-4A

Correct Answer:- Option-B

Question33:-Kirchhoff's current law is applicable to only

A:-Closed loops in a network

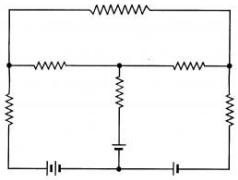
B:-Electronic circuits

C:-Junctions in a network

D:-Electric circuits

Correct Answer:- Option-C

Question34:-Minimum number of meshes required to solve the given circuit is



A:-1

B:-2

C:-3

D:-4

Correct Answer:- Option-C

Question35:-In nodal analysis, there are N nodes in the circuit. Number of equations required to solve the network.

A:-N

B:-N – 1

C:-N + 1

D:-N – 2

Correct Answer:- Option-B

Question36:-The magnetic flux density in an air-cored coil is 0.05 Wb/m^2. With a cast iron core of relative permeability 400 inserted, the flux density will become

A:-10 Wb/m^2

B:-20 Wb/m^2

C:-30 Wb/m^2

D:-40 Wb/m^2

Correct Answer:- Option-B

Question37:-According to Faraday's Laws of Electromagnetic induction, an e.m.f. is induced in a conductor whenever

A:-It lies in a magnetic field

B:-There is a rate of change of magnetic flux through the conductor

C:-It moves parallel to the direction of the magnetic field

D:-It lies perpendicular to the magnetic flux

Correct Answer:- Option-B

Question38:-Two coupled coils connected in series have an equivalent inductance of 8 mH or 4 mH depending on the interconnection. Then the mutual inductance M between the coils is

A:-1 mH

B:-2 mH

C:-3 mH

D:-4 mH

Correct Answer:- Option-A

Question39:-The rms value of a sine wave is 230 V. Its peak value is

A:-162.63 V

B:-325.27 V

C:-132.39 V

D:-398.37 V

Correct Answer:- Option-B

Question40:-An alternating current is given by i = 10 sin 314t. Measuring time from t = 0, the time taken by the current to reach – 10 A for the second time is

A:-0.02 second

B:-0.025 second

C:-0.03 second

D:-0.035 second

Correct Answer:- Option-D

Question41:-The voltage applied to a circuit is $200\sqrt{2}\sin(100\pi t)$ volts and draws a current of $20\sqrt{2}\cos(100\pi t + \pi/4)$ amperes. Taking the voltage as the reference phasor, the phasor representation of the current in amperes is

A:-$20 \angle \pi$

B:-$20 \angle -\pi$

C:-$20 \angle 3\pi/4$

D:-$20 \angle -3\pi/4$

Correct Answer:- Option-C

Question42:-The power factor of a series RLC circuit is

A:-Always zero

B:-Between zero and 1

C:-Always unity

D:-Between zero and – 1

Correct Answer:- Option-B

Question43:-In a series RLC circuit, the inductance is changed from L to L/2. For the same resonant frequency, the capacitance should be changed from C to

A:-2 C

B:-C/2

C:-4 C

D:-C/4

Correct Answer:- Option-A

Question44:-In a series RL circuit, I_R is the current through resistor and I_L is the current through inductor, then

A:-I_R is in phase with I_L

B:-I_R lags I_L by 90°

C:-I_R leads I_L by 90°

D:-$I_R$is out of phase with I_L

Correct Answer:- Option-A

Question45:-A voltage of 100 $\angle$ 20º V drives a current of 10 $\angle$ 80° A through a single phase load. The power consumed by the load is

A:-1000 W

B:-866 W

C:-707 W

D:-500 W

Correct Answer:- Option-D

Question46:-A resistor has a colour-code bands Green Violet Brown Gold. It's nominal value is

A:-57 kΩ $\pm$ 10%

B:-570 Ω $\pm$ 5%

C:-57 kΩ $\pm$ 5%

D:-570 Ω $\pm$ 10%

Correct Answer:- Option-B

Question47:-Which of the following statement is/are true about a PN junction diode ?

i. An ideal PN junction diode acts as an open circuit in forward bias and a short circuit in

reverse bias.
ii. The reverse-biased PN junction diode will have a very narrow depletion layer.
iii. When the PN junction diode is reverse-biased, a very small current flows through the diode.
iv. There are no free charge carriers in the depletion region.

A:-Only i and iii

B:-Only ii and iv

C:-Only iv

D:-Only iii and iv

Correct Answer:- Option-D

Question48:-Which of the following statement is/are true about Bipolar junction transistors ?
i. The emitter current is always the largest.
ii. A transistor is said to be in saturation when it does not conduct current.
iii. The leakage current stops when emitter is disconnected from DC supply.
iv. The total collector current is the sum of majority and minority charge carriers.

A:-Only i and iii

B:-Only ii and iv

C:-Only i and iv

D:-Only iii and iv

Correct Answer:- Option-C

Question49:-In the output characteristics of a common emitter configuration

A:-I_B varies with changes in V_{CE} when I_C is kept constant

B:-When I_B is zero, no collector current flows even when V_{CE} is increased

C:-Avalanche breakdown cause I_C to increase rapidly

D:-In saturation region, changes in I_B produces a corresponding change in I_C

Correct Answer:- Option-C

Question50:-Varistor is used to

A:-Burn open easily when the power rating is exceeded

B:-Protect circuitry from high energy voltage transients

C:-Direct very small changes in the temperature

D:-Change resistance when illuminated with light energy

Correct Answer:- Option-B

Question51:-Which of the following statement is/are true about Bridge rectifier ?
i. Entire secondary voltage can be used as the input to the rectifier.
ii. If one diode opens, output frequency will be doubled.
iii. Transformer used is larger as compared to center-tapped full wave rectifier.
iv. Ideal peak output voltage is equal to a center-tapped full wave rectifier.

A:-Only ii and iii

B:-Only i and iv

C:-Only i

D:-Only iv

Correct Answer:- Option-C

Question52:-Which of the following statement is/are true about Zener Diode used as a voltage regulator ?

i. Breakdown voltage increases with increase in current.
ii. If load current changes output voltage remains constant.
iii. Minimum value of Zener current must be maintained in order to keep the diode in Breakdown region.
iv. The load voltage is zero when it is operating in the breakdown region.

A:-Only ii and iii

B:-Only i and ii

C:-All of the above

D:-Only i and iii

Correct Answer:- Option-A

Question53:-Which of the following statement is/are true about Public Address system ?

i. Must reduce reverberations.
ii. Microphone is a transducer used to convert electrical signal to sound signal.
iii. It must increase the acoustic feedback.

A:-Only i

B:-All of the above

C:-Only iii

D:-Only i and iii

Correct Answer:- Option-A

Question54:-In the frequency response curve of a RC coupled amplifier

A:-Voltage gain drops in the mid frequency range

B:-Voltage gain is uniform in the lower frequency range

C:-Voltage gain drops in the higher frequency range

D:-Voltage gain is uniform in the higher frequency range

Correct Answer:- Option-C

Question55:-In a common emitter amplifier

A:-The input resistance is very high

B:-The input signal is applied to the emitter terminal of the transistor

C:-Coupling capacitors are used to reduce distortions

D:-The output will have the same frequency as the input but with 180 degree phase shift

Correct Answer:- Option-D

Question56:-Comparing AM transmission and FM transmission

i. AM radio is a line of sight system
ii. AM broadcast band has higher frequencies than FM broadcast band
iii. FM has noise immunity advantage
iv. FM has higher fidelity

A:-Only iii and iv

B:-Only i and iv

C:-Only i and iii

D:-Only ii and iii

Correct Answer:- Option-A

Question57:-An audio signal of 5 kHz frequency is amplitude modulated with a carrier signal of 1.6 MHz frequency. Which of the following statement is true ?

A:-The bandwidth required is 5 kHz

B:-The sideband frequencies are 1605 kHz and 1610 kHz

C:-The bandwidth required is 11 kHz

D:-The sideband frequencies are 1605 kHz and 1595 kHz

Correct Answer:- Option-D

Question58:-All the succeeding stages of a super heterodyne receiver operates on

A:-Intermediate frequency

B:-Radio frequency

C:-Low frequency

D:-High frequency

Correct Answer:- Option-A

Question59:-Which of the following is true with respect to antenna ?
i. To make it more directional, its size must be reduced.
ii. The efficiency of antenna will be 62.5% when antenna resistance is 30% and radiation
resistance is 50%.
iii. Minimum length of the antenna required to send a signal of frequency 500 kHz is 150 m.

A:-Only i and iii

B:-Only ii

C:-Only iii

D:-Only ii and iii

Correct Answer:- Option-D

Question60:-Which of the following statements are true ?
i. Fading of signals is caused due to obstacles.
ii. Handoff is the process of transferring a mobile telephone call from one cell to another
without dropping the call.
iii. Circle is a universally adopted shape of cell.

A:-Only i and iii

B:-Only i and ii

C:-Only i

D:-All of the above

Correct Answer:- Option-B

Question61:-The storage element within the processor is known as

A:-Buffer

B:-ROM

C:-Register

D:-RAM

Correct Answer:- Option-C

Question62:-DRAM cell is made up of

A:-Flip flops

B:-Logic gates

C:-Transistors and resistors

D:-Transistors and capacitors

Correct Answer:- Option-D

Question63:-After compiling the program code, the file that contains the resulting output is referred to as

A:-Source code

B:-Linked code

C:-Executable code

D:-None of the above

Correct Answer:- Option-D

Question64:-Program should be written as a single continuous block without any break in

A:-Structured programming

B:-Unstructured programming

C:-Model based programming

D:-Procedural programming

Correct Answer:- Option-B

Question65:-The number of passes required to sort an array of n elements with bubble sort is

A:-n – 1

B:-n + 1

C:-n

D:-n^2

Correct Answer:- Option-A

Question66:-This of the following is not a valid type modifier in C.

A:-Signed

B:-Byte

C:-Long long

D:-None of the above

Correct Answer:- Option-B

Question67:-What will be the value of b in following code segment.

```
#include <stdio.h>
int main()
{
  int b = printf("Message");
  printf("%d", b);
  return 0;
}
```

A:-14

B:-1

C:-7

D:-Compilation error

Correct Answer:- Option-C

Question68:-The data type which does not allowed as a switch expressionin C.

A:-int

B:-char

C:-float

D:-enum

Correct Answer:- Option-C

Question69:-The following declaration in C indicates

```
int p : 8;
```

A:-p is an 8-bit integer

B:-p stores a value of 8

C:-Both 1 and 2

D:-None of the above

Correct Answer:- Option-A

Question70:-What will be the following code segment ?

```
#include<stdio.h>
int main()
{
  int x;
  for (x = 5; x!=0; x--)
     printf("%d", x--);
  return 0;
}
```

A:-5 4 3 2 1

B:-5 3 1

C:-Looop won't works

D:-Infinite loop

Correct Answer:- Option-D

Question71:-This of the following is not a valid 2-dimensional array declaration.

A:-int arr[3] [3]={1,2,3,4,5,6,7,8,9};

B:-int arr[][3]={1,2,3,4,5,6,7,8,9};

C:-int arr[3][]={1,2,3,4,5,6};

D:-All of the above

Correct Answer:- Option-C

Question72:-Predict the output of following code segment.

```
#include<stdio.h>
int main()
{
   int array[10] = {1,2,3,4,5};
   printf("%d", array[5]);

   return 0;
}
```

A:-0

B:-5

C:-Garbage value

D:-None of the above

Correct Answer:- Option-A

Question73:-In the below code; what will be the value of x ?

```
#include<stdio.h>
#include<string.h>
int main() {
   char s1[] = "hello";
   char S2[] = "world";
   int x = strcmp(s1, s2);
   printf("%d", x);
   return 0;
}
```

A:-Zero

B:-Greater than zero

C:-Less than zero

D:-Some string

Correct Answer:- Option-C

Question74:-This of the following is/are true about linear search performed in an array of size N.

I. Linear search works only in ordered list of elements.
II. The worst case; number of comparisons needed is N.

A:-Only I

B:-Only II

C:-Both I and II

D:-None of these

Correct Answer:- Option-B

Question75:-What does the string handling function *strchr(s1, ch)* does ?

A:-Returns a pointer to the last occurrence of character ch in string s1

B:-Returns a pointer to the first occurrence of character ch in string s1

C:-Returns a pointer to all occurrence of character ch in string s1

D:-Count the number of occurrence of character ch in string s1

Correct Answer:- Option-B

Question76:-A body falling from a height of 10 m rebounds from the hard floor. If it loses 20% of energy in the impact, how high will it rebound ?

A:-10 m

B:-20 m

C:-8 m

D:-12 m

Correct Answer:- Option-C

Question77:-Rain drops are falling with constant velocity near the surface of earth. Choose the correct alternative related to the above statement.

A:-The above statement is false as rain drops are continuously accelerated towards the surface of earth

B:-The above statement is true and is in accordance with Stoke's law

C:-The above statement is false according to the law of conservation of energy

D:-Rain drops will not experience any gravity near the surface of earth

Correct Answer:- Option-B

Question78:-Choose the options which have correct statements about Laser in the three coloumns of table.

i.	LASER light is coherent	Population inversion can be achieved by optical pumping	In metastable state electrons have comparatively longer life
ii.	LASER light is highly divergent	When population inversion is achieved, the number of electrons in the lower energy level will be more than that of excited level	Spontaneous emission is the only reason for the production of LASER light
iii.	LASER light is monochromatic	When population inversion is achieved, the number of electrons in the excited energy level will be more than that of lower energy level	Stimulated emission is the basic principle of LASER action
iv.	LASER light is highly intense	Population inversion can be achieved by electric discharge and atom-atom collisions	Laser can be used as a tool for surgery

A:-All are correct

B:-Only i is correct

C:-i and iii are correct

D:-i, iii and iv are correct

Correct Answer:-Question Cancelled

Question79:-An electron in a constant electric field

A:-will not experience any force

B:-will move in a direction perpendicular to that of electric field

C:-will move in the direction of electric field

D:-will move in the opposite direction of electric field

Correct Answer:- Option-D

Question80:-9 Ohm and 2 Ohm are the effective resistance when two resistors are connected in series and parallel respectively. The individual resistances are

A:-5 Ohm and 4 Ohm

B:-6 Ohm and 3 Ohm

C:-7 Ohm and 2 Ohm

D:-8 Ohm and 1 Ohm

Correct Answer:- Option-B

Question81:-When an electron revolving around the nucleus of an atom

A:-It is equivalent to a circular loop of current and will produce magnetic field

B:-As electrons have negative charge it cannot be considered as a circular loop of current

C:-The rotation of electrons never produce any magnetic field

D:-Circular loops of current never produce magnetic fields

Correct Answer:- Option-A

Question82:-When two infinite parallel conductors are held parallel to each other and currents are flowing in the same direction

A:-The conductors will repel each other and the repulsive force is independent of currents

B:-The conductors will repel each other and the repulsive force depends on currents

C:-The conductors will attract each other and the attractive force is independent of currents

D:-The conductors will attract each other and the attractive force depends on currents

Correct Answer:- Option-D

Question83:-A boy suffered from severe fever and admitted in the hospital. His body temperature is measured to be 100 by a thermometer. But when a drop of water accidently incident on his body, it didn't boil.
Choose the correct reason for the above.

A:-Human body will not boil water as ordinary heat sources

B:-The drop of water decreases the body temperature at that moment and

after some time it will start to boil

C:-The thermometer is calibrated in Fahrenheit scale

D:-The thermometer is calibrated in Celsius scale

Correct Answer:- Option-C

Question84:-Which of the following statements are correct related to the number of electrons and holes in a semiconductor ?

A:-Numbers of electrons and holes are equal in an intrinsic semiconductor

B:-Number of electrons are more than the number of holes in an n-type semiconductor

C:-Number of holes are more than the number of electrons in a p-type semiconductor

D:-All of the above

Correct Answer:- Option-D

Question85:-In telecommunication waves are transmitted through an optical fibre by

A:-Electrical conduction through the wires

B:-Total internal reflection of waves

C:-Dispersion of waves

D:-None of the above

Correct Answer:- Option-B

$$\begin{vmatrix} x^2 - x & x - 1 \\ x + 1 & x + 1 \end{vmatrix}$$

Question86:-Evaluate

A:-$x^3 - x^2 - x + 1$

B:-$x^3 + x^2 - x + 1$

C:-$x^3 + x^2 - x - 1$

D:-$x^3 - x^2 - x - 1$

Correct Answer:- Option-A

Question87:-$\begin{bmatrix} a & b \\ -b & a \end{bmatrix}\begin{bmatrix} a & -b \\ b & -a \end{bmatrix}$

The product of these two matrices is

A:-$\begin{bmatrix} a^2+b^2 & 0 \\ 0 & a^2+b^2 \end{bmatrix}$

B:-$\begin{bmatrix} a^2+b^2 & 0 \\ 0 & a^2-b^2 \end{bmatrix}$

C:-$\begin{bmatrix} a^2+b^2 & -2ab \\ 0 & b^2-a^2 \end{bmatrix}$

D:-$\begin{bmatrix} a^2+b^2 & -2ab \\ 0 & b^2+a^2 \end{bmatrix}$

Correct Answer:- Option-C

Question88:-The transpose of the inverse of the matrix $A=\begin{bmatrix}2 & 1\\ 1 & 1\end{bmatrix}$ is

A:-$\begin{bmatrix}-1 & -1\\ -1 & 2\end{bmatrix}$

B:-$\begin{bmatrix}-1 & -1\\ 1 & -2\end{bmatrix}$

C:-$\begin{bmatrix}1 & -1\\ -1 & -2\end{bmatrix}$

D:-$\begin{bmatrix}1 & -1\\ -1 & 2\end{bmatrix}$

Correct Answer:- Option-D

Question89:-The value of $2\sin^2\frac{3\pi}{4} + 2\cos^2\frac{\pi}{4}$ is

A:-0

B:-2

C:-1

D:-–1

Correct Answer:- Option-B

Question90:-If tanA = $\frac{5}{6}$ and $\tan B=\frac{1}{11}$. Then A + B is

A:-$\pi/2$

B:-$\frac{\pi}{4}$

C:-π

D:-2π

Correct Answer:- Option-B

Question91:-cos 55° + cos 65° has value

A:-0

B:-1

C:-cos 5°

D:-sin 5°

Correct Answer:- Option-C

Question92:-Find the unit vector in the direction of the sum of the vectors $\hat{i}+2\hat{j}-5\hat{k}$ and $2\hat{i}+\hat{j}+3\hat{k}$

A:-$\frac{3\hat{i}+3\hat{j}-2\hat{k}}{\sqrt{22}}$

B:-$\frac{3\hat{i}-3\hat{j}-2\hat{k}}{\sqrt{22}}$

C:-$\frac{3\hat{i}+3\hat{j}-2\hat{k}}{\sqrt{23}}$

D:- $\frac{3\hat{i} - 3\hat{j} - 2\hat{k}}{\sqrt{23}}$

Correct Answer:- Option-A

Question93:-Which of the following statements are correct about the dot product $\vec{a} \cdot \vec{b}$ of two vectors.

i. $\vec{a} \cdot \vec{b}$ is a real number.

ii. If, $\vec{a}$ and $\vec{b}$ are perpendicular then $\vec{a} \cdot \vec{b} = 0 \ (\vec{a} \neq 0, \vec{b} \neq 0)$

iii. The angle between two non zero vectors is given by $\theta = \cos^{-1}\left(\frac{\vec{a} \cdot \vec{b}}{|\vec{a}||\vec{b}|}\right)$

A:-Only i and ii are true

B:-Only ii and iii are true

C:-None of the above

D:-All the above

Correct Answer:- Option-D

Question94:-Find the area of a parallelogram whose adjacent sides are given by the vectors $\vec{a} = 3\hat{i} + \hat{j} + 4\hat{k}$ and $\vec{b} = \hat{i} - \hat{j}$

A:-$\sqrt{45}$

B:-$\sqrt{46}$

C:-$\sqrt{48}$

D:-$\sqrt{50}$

Correct Answer:- Option-C

Question95:-Find the derivative of the function $e^{\sin[\log(18x)]}$

A:- $e^{\sin[\log(18x)]} \times \cos[\log(18x)] \times \frac{1}{18x} \times 18$

B:- $e^{\sin[\log(18x)]} \times -\cos[\log(18x)] \times \frac{1}{18x} \times 18$

C:- $-e^{\sin[-\log(18x)]} \times -\cos[-\log(18x)] \times \frac{1}{18x} \times 18$

D:- $e^{\sin[\log(18x)]} \times \cos[\log(x)] \times \frac{1}{18x} \times 18$

Correct Answer:- Option-A

Question96:-If y = Acospx + Bsinpx (A, B, P are constants), then $\frac{d^2y}{dx^2}$ is

A:-p^2y

B:-$-p^2y$

C:-p^2Ay

D:-$-p^2Ay$

Correct Answer:- Option-B

Question97:-If x = ksecθ, y = m tanθ find $\frac{dy}{dx}$, k and m are constants

A:-$\frac{dy}{dx}=\frac{m}{k}\cos\theta$

B:-$\frac{dy}{dx}=\frac{m}{k}\tan\theta$

C:-$\frac{dy}{dx}=\frac{m}{k}\operatorname{cosec}\theta$

D:-$\frac{dy}{dx}=\frac{m}{k}\sec\theta$

Correct Answer:- Option-C

Question98:- $\int_0^{\pi/2} 3\sin^2 x\,dx$ is

A:-$\frac{\pi}{4}$

B:-$\frac{3\pi}{4}$

C:-$\frac{5\pi}{4}$

D:-0

Correct Answer:- Option-B

Question99:-Find the area enclosed between the parabola y = $x^2-x-2 \text{ and } the$ X axis

A:-$\frac{9}{4}$

B:-$\frac{9}{5}$

C:-$\frac{-9}{2}$

D:-$\frac{9}{2}$

Correct Answer:- Option-D

Question100:-The solution of the linear differential equation $\frac{dy}{dx}+\frac{5}{x}y=8x$ is

A:- $x^5y=\frac{8}{7}x^7+C$

B:- $x^6y=\frac{8}{5}x^7+C$

C:- $x^5y=\frac{8}{5}x^7+C$

D:-None of these

Correct Answer:- Option-A