PROVISIONAL ANSWER KEY

Question Paper Code: 5/2024/OL

Exam:KEAM2024 05

Date of Test: 05-06-2024

1. The dimensional formula of the gravitational constant is $M^a L^b T^c$, the values of a , b , c are respectively

A) 1, 3, -2
B) -1, 3, 2
C) -1, 3, -2
D) 1, -3, 2
E) 1, -3, -2

Correct Answer : Option C

2. If the position of the particle is $\mathbf{r} = 3\,\mathbf{i} + 2\,t^2\mathbf{j}$ then the magnitude of its velocity at $t = 5$ second in ms^{-1} is

A) 20
B) 10
C) 40
D) 50
E) 30

Correct Answer : Option A

3. If a freely falling body covers 80 m in the first 4 seconds , then in the next 4 seconds it covers a distance of

A) 160 m
B) 240 m
C) 320 m
D) 80 m
E) 100 m

Correct Answer : Option B

4. Find the TRUE statement of the algebraic operations of scalar and vector quantities

A) Adding two scalars of different dimension is possible
B) Adding a scalar to a vector of same dimension is possible
C) Multiplying any two scalars is possible
D) Multiplying any vector by any scalar is not possible
E) Adding any two vectors is not possible

Correct Answer : Option C

5. A car moving with a speed, v is stopped at a distance d by a retarding force F. The force needed to stop the same car moving with the speed 3v within the same distance is

A) 3F
B) 6F
C) 8F
D) 9F
E) 12F

Correct Answer : Option D

6. A ballon of mass 60 g is moving up with an acceleration of 4 ms^{-2} .The mass to be added to the balloon to descend it down with the same acceleration is (g = 10 ms^{-2})

A) 60 g
B) 80 g
C) 100 g
D) 120 g
E) 40 g

Correct Answer : Option B

7. A body of mass M is at equilibrium under the action of four forces **F1** , **F2** , **F3** and **F4** . If **F1** is removed from the body then the body moves with an acceleration of

A) $\frac{\mathbf{F_1}}{\mathrm{M}}$
B) $\frac{\mathbf{F_1}+\mathbf{F_2}}{2\mathrm{M}}$
C) $\frac{\mathbf{F_1}+\mathbf{F_3}}{2\mathrm{M}}$
D) $\frac{\mathbf{F_1}+\mathbf{F_4}}{\mathrm{M}}$
E) $\frac{\mathbf{F_4}}{\mathrm{M}}$

Correct Answer : Option A

8. If a body at rest undergoes one dimensional motion with constant acceleration, then the power delivered to it at a time *t* is proportional to

A) $\sqrt{t}$
B) t^2
C) t^3
D) $t^{3/2}$
E) t

Correct Answer : Option E

9. The collision in which the two colliding particles move together after collision is called

A) completely inelastic collision
B) elastic collision
C) partial inelastic collision
D) collision without transfer of energy
E) partial elastic collision

Correct Answer : Option A

10. The analogy between linear motion and rotational motion are given. The FALSE one is

A) Force : Torque

B) Linear Displacement : Angular displacement
C) Mass : Moment of inertia
D) Linear momentum : Angular momentum
E) Translational energy : Vibrational energy

Correct Answer : Option E

11. If an ideal engine needs to transmit a torque 200 Nm to maintain a rotor at a uniform angular speed of 300 $rads^{-1}$, then the power required for the engine is

A) 30 kW
B) 60 kW
C) 90 kW
D) 150 kW
E) 300 kW

Correct Answer : Option B

12. If a body is taken above the surface of earth, it looses its weight by 20 % at a height of

A) $\frac{\sqrt{5}}{2}R$

B) $(\frac{\sqrt{5}}{2} - 3)R$

C) $(\frac{\sqrt{5}}{2} - 1)R$

D) $(\frac{\sqrt{5}}{2} - 2)R$

E) $(1 + \frac{\sqrt{5}}{2})R$

Correct Answer : Option C

13. If a planet orbits the sun in an elliptical orbit the quantities associated with the planet that remain constant are

A) kinetic energy and total energy
B) potential energy and angular momentum
C) linear speed and angular velocity
D) total energy and angular momentum
E) kinetic energy and angular velocity

Correct Answer : Option D

14. For the flow of incompressible liquid through a pipe, the Venturi-meter is used to measure the

A) pressure of liquid
B) volume of flow
C) speed of flow
D) temperature of liquid
E) mass of liquid flown

Correct Answer : Option C

15. Two gases under the same thermal conditions have same number of molecules per unit volume. If the respective molecular diameters of the gases are in the ratio 1 : 3, then their respective mean free paths are in the ratio

A) 1 : 1
B) 1 : 3
C) 3 : 1
D) 9 : 1
E) 4 : 9

Correct Answer : Option D

16. The quantity of heat conducted through a metal rod kept its ends at $100^{\circ}C$ and $120^{\circ}C$ is $5\ Js^{-1}$. If the ends are kept at $200^{\circ}C$ and $220^{\circ}C$ then the quantity of heat conducted in 10 seconds is

A) 5 J
B) 25 J
C) 10 J
D) 100 J
E) 50 J

Correct Answer : Option E

17. If an ideal gas, in an insulated vessel is allowed to expand into another similar evacuated vessel through a valve then

A) external work is done on the gas
B) the pressure of the gas is doubled
C) the volume of the gas is doubled
D) the pressure of the gas remains same
E) the temperature of the gas is increased

Correct Answer : Option C

18. In a Carnot engine, the temperature of the sink is 350 K. If the efficiency of the engine is 50 %, the temperature of the source should be

A) 700 K
B) 750 K
C) 800 K
D) 900 K
E) 1000 K

Correct Answer : Option A

19. The ratio of the respective **rms** velocities of the gas molecules of an ideal gas at $327^{\circ}C$ and at $627^{\circ}C$ is

A) $\sqrt{2} : 3$
B) $\sqrt{2} : 2\sqrt{3}$
C) $\sqrt{2} : \sqrt{3}$

D) $\sqrt{3}$: 2

E) $\sqrt{3}$: 3

Correct Answer : Option C

20. The total energy of a gas mixture of one mole of oxygen and 3 moles of argon at a temperature T by neglecting vibrational modes is

A) 5 RT
B) (7/2) RT
C) (5/2) RT
D) 9 RT
E) 7 RT

Correct Answer : Option E

21. A man fires bullets at two hillocks one shorter and the other taller, the taller one is behind the smaller one. If the first echo is heard after 6 s and the second echo after 12s , then the distance between the hillocks is (velocity of sound in air 330 ms^{-1})

A) 660 m
B) 990 m
C) 1320 m
D) 500 m
E) 860 m

Correct Answer : Option B

22. If a particle executing simple hormonic motion with period T and displacement x = A cos ωt, then the acceleration and velocity of the particle at the time T/2 are respectively

A) 0, Aω
B) 0, $A^2\omega$
C) 0, $A\omega^2$
D) - A, $A^2\omega$
E) - A , $A\omega^2$

Correct Answer : Option C

23. The equipotential surface is

A) a plane for a point charge
B) spherical for a dipole
C) cylindrical for a dipole
D) spherical for a point charge
E) cylindrical for a point charge

Correct Answer : Option D

24. The electric field intensity due to an ideal dipole at a distance *r* from its centre on the axial point is directly proportional to

A) r^2

B) r^3

C) $\frac{1}{r^2}$

D) $\frac{1}{r}$

E) $\frac{1}{r^3}$

Correct Answer : Option E

25. Two spheres A and B having respective charges 6 C and 12 C placed at a distance d repel each other by a force F. The charge given to sphere A to reverse the force as – F is

A) $-8C$

B) $-12C$

C) $-10C$

D) $-6C$

E) $-15C$

Correct Answer : Option B

26. The work done by a source in taking a unit charge from lower to higher potential energy is called the source's

A) electric current

B) electric conductivity

C) electric field intensity

D) electromotive force

E) electric flux

Correct Answer : Option D

27. A Wheatstone network ABCDA has the resistances 20 Ω, 10 Ω and 12 Ω in AB, BC and DA arms respectively in which galvanometer is connected across BD. For null deflection in the galvanometer the resistance in CD arm should be

A) 5 Ω

B) 4 Ω

C) 10 Ω

D) 8 Ω

E) 6 Ω

Correct Answer : Option E

28. If a charged particle enters a uniform magnetic field B , with a velocity v such that v has a component along B , then the charged particle describes

A) a circular path

B) an elliptical path

C) a straight line
D) a helical path
E) a parabolic path

Correct Answer : Option D

29. A proton with kinetic energy of 2 MeV is describing a circular path of radius R in a uniform magnetic field. The kinetic energy of the deuteron to describe the same circular path in the same field is

A) 0.5 MeV
B) 1 MeV
C) 2 MeV
D) 4 MeV
E) 0.25 MeV

Correct Answer : Option B

30. Two straight long parallel wires carrying equal amount of current in opposite directions placed at 5 cm apart are repel each other by a force F. If the current in one of wire is doubled and reversed, then the force between them is

A) 2 F and attractive
B) F/2 and repulsive
C) F and repulsive
D) 2F and repulsive
E) F/2 and attractive

Correct Answer : Option A

31. The mutual inductance between a pair of coils A and B placed close to each other depends upon

A) the rate of change of current in A
B) the rate of change of current in A and B
C) the material of the wire of the coils
D) the relative position and orientation of A and B
E) the direction of flow of current in B

Correct Answer : Option D

32. In an LCR resonance circuit at resonance frequency ω_0 the quality factor Q is

A) $\omega_0 LR$
B) $\omega_0 LC$
C) $\frac{\omega_0}{LR}$
D) $\omega_0\sqrt{LC}$
E) $\frac{\omega_0 L}{R}$

Correct Answer : Option E

33. The ratio between the magnetic dipole moment of a revolving electron in circular orbit to its angular momentum is (*e* charge and *m* mass of the electron)

A) $\frac{e^2}{2m}$

B) $\frac{e^2}{m}$

C) $\frac{e}{2m}$

D) $\frac{e}{m^2}$

E) $\frac{e}{2m^2}$

Correct Answer : Option C

34. The electromagnetic waves used in LASIK and cell phones are respectively

A) microwaves and radio waves

B) ultraviolet rays and radio waves

C) infrared rays and micro waves

D) X- rays and radio waves

E) radio waves and visible rays

Correct Answer : Option B

35. If a ray of light passes through a medium , its frequency and wavelength are 4×10^{14} Hz and 450 nm respectively. Then the refractive index of the medium is

A) 1.67

B) 1.5

C) 1.414

D) 1.33

E) 1.2

Correct Answer : Option A

36. If the power of a lens is - 2.0 D, then the type and focal length f of the lens are

A) convex lens, 40 cm

B) concave lens, 50 cm

C) convex lens, 25 cm

D) concave lens, 20 cm

E) convex lens, 30 cm

Correct Answer : Option B

37. In an Young double slit experiment without varying the distance of the screen and the slit separation if the wavelength of monochromatic source is changed one by one in the ratio 2 : 3 : 4 then the corresponding fringe widths measured will be in the ratio

A) 4 : 3 : 2

B) 1 : 2 : 3

C) 2 : 3 : 4

D) 6 : 4 : 3

E) 3 : 4 : 6

Correct Answer : Option C

38. Which one of the following phenomena does not occur when a white light falls on an equilateral glass prism?

A) Reflection
B) Refraction
C) Dispersion
D) Deviation
E) Interference

Correct Answer : Option E

39. The de Broglie wavelength associated with the electrons accelerated by a potential of 81 V is lying in the region of electromagnetic waves

A) ultraviolet rays
B) infrared rays
C) microwaves
D) X- rays
E) γ – rays

Correct Answer : Option D

40. If the frequency of the incident light on a metal surface is increased by 10% then the kinetic energy of the emitted photoelectrons is increased from 0.5eV to 0.7 eV. Then the work function of the metal is

A) 1 eV
B) 1.2 eV
C) 1.5 eV
D) 1.8 eV
E) 2 eV

Correct Answer : Option C

41. The ratio of the velocities of the electron in the second, third and fourth Bohr's orbits of hydrogen atom is

A) 3 : 2 : 1
B) 1 : 2 : 3
C) 1 : 4 : 9
D) 6 : 4 : 3
E) 9 : 4 : 1

Correct Answer : Option D

42. Plutonium nucleus undergoes fission with

A) fast neutrons
B) slow neutrons
C) fast deuterons
D) slow deuterons
E) fast α - particles

Correct Answer : Option B

43. Out of the following pair of elements identify isotones

A) $^{2}_{1}H$ and $^{3}_{1}H$

B) $^{197}_{79}Au$ and $^{198}_{80}Hg$

C) $^{3}_{1}H$ and $^{3}_{2}He$

D) $^{35}_{17}Cl$ and $^{37}_{17}Cl$

E) $^{235}_{92}U$ and $^{238}_{92}U$

Correct Answer : Option B

44. If E_c and E_v represent the energy of the conduction band and valance band, E_D and E_g represent the donor energy level and the band gap in a n-type semiconductor then the true relation among them is

A) $E_c = E_D$

B) $E_D > E_c$

C) $E_D > E_v$

D) $E_c - E_v = 2E_g$

E) $E_c + E_g = E_v$

Correct Answer : Option C

45. During the formation of p – n junction

A) majority holes diffuse from n side to p side

B) majority electrons diffuse from p side to n side

C) ionized donors formed on p side

D) ionized acceptors formed on n side

E) the space charge region on either side of the junction is called depletion region

Correct Answer : Option E

46. What is the mass of crystalline oxalic acid (molar mass=126 g mol^{-1}) present in 50 mL of 0.02N aqueous oxalic acid solution?

A) 63 mg

B) 6.3 mg

C) 31.5 mg

D) 0.063 mg

E) 310 mg

Correct Answer : Option A

47. The correct electronic configuration of Tc (Z=43) is

A) $[Kr]4d^{6}5s^{1}5p^{0}$

B) $[Kr]4d^{3}5s^{1}5p^{3}$

C) $[Kr]4d^5 5s^2 5p^0$

D) $[Kr]4d^7 5s^0 5p^0$

E) $[Kr]4d^4 5s^2 5p^1$

Correct Answer : Option C

48. What is the mass of water formed when 1.6 g of methane gas is completely burnt in excess oxygen?

A) 1.8 g
B) 2.4 g
C) 3.2 g
D) 3.6 g
E) 4.8 g

Correct Answer : Option D

49. The number of angular and radial nodes present in '4d' orbitals are respectively

A) 2, 1
B) 4, 3
C) 2, 2
D) 3, 2
E) 4, 2

Correct Answer : Option A

50. Which of the following isoelectronic species has the smallest radius?

A) Mg^{2+}

B) F^-

C) Na^+

D) O^{2-}

E) Al^{3+}

Correct Answer : Option E

51. Which of the following molecule has the highest dipole moment?

A) NH_3

B) NF_3

C) CCl_4

D) BeF_2

E) BF_3

Correct Answer : Option A

52. Which of the following aqueous mixture is a buffer solution?

A) Acetic acid + Ammonium chloride
B) Hydrochloric acid + Potassium acetate

C) Acetic acid + Sodium chloride
D) Acetic acid + Sodium acetate
E) Sodium hydroxide + Potassium acetate

Correct Answer : Option D

53. The observed molecular weight of 1:1 strong electrolyte is 117 g mol^{-1} as determined by the depression of freezing point method. Its theoretical molecular weight is 60 g mol^{-1}.The percentage of dissociation of the electrolyte is

A) 90%
B) 95%
C) 100%
D) 85%
E) 80%

Correct Answer : Option B

54. Thermal decomposition of a compound X follows first order kinetics. The initial concentration of X is 2 mol L^{-1}. It decreased to 0.125 mol L^{-1} in one hour at 400K. What is the half-life period of the reaction at 400K? (log 2 = 0.3010)

A) 15 min
B) 20 min
C) 30 min
D) 25 min
E) 10 min

Correct Answer : Option A

55. Some enzyme catalysed reactions which occur at metal surfaces are

A) first order reactions
B) second order reactions
C) third order reactions
D) fractional order reactions
E) zero order reactions

Correct Answer : Option E

56. The sum of the oxidation numbers of all the carbon and oxygen atoms in carbonate ion is

A) +1
B) +2
C) -2
D) -1
E) -3

Correct Answer : Option C

57. In which of the following equilibrium, increase in pressure shift the equilibrium in the forward direction?

A) $H_2(g) + I_2(g) \leftrightharpoons 2HI(g)$

B) $PCl_5(g) \leftrightharpoons PCl_3(g) + Cl_2(g)$

C) $N_2(g) + O_2(g) \leftrightharpoons 2NO(g)$

D) $CO(g) + 3H_2(g) \leftrightharpoons CH_4(g) + H_2O(g)$

E) $CO(g) + H_2O(g) \leftrightharpoons CO_2(g) + H_2(g)$

Correct Answer : Option D

58. Enthalpy of combustion of ethylene gas at constant pressure of 1 atm and at 300 K is -1410 kJ mol^{-1}. The enthalpy change for the reaction at constat volume and at the same temperature is about ($R=8.3$ J K^{-1} mol^{-1})

A) -1405 kJ mol^{-1}

B) -1415 kJ mol^{-1}

C) -1407.5 kJ mol^{-1}

D) -1417.5 kJ mol^{-1}

E) -1402.5 kJ mol^{-1}

Correct Answer : Option A

59. For which one of the following equilibria, $K_P = K_C$?

A) $N_2(g) + 3H_2(g) \leftrightharpoons 2NH_3(g)$

B) $2SO_2(g) + O_2(g) \leftrightharpoons 2SO_3(g)$

C) $N_2O_4(g) \leftrightharpoons 2NO_2(g)$

D) $PCl_5(g) \leftrightharpoons PCl_3(g) + Cl_2(g)$

E) $H_2(g) + Br_2(g) \leftrightharpoons 2HBr(g)$

Correct Answer : Option E

60. For which of the following molecule, resonance structures are necessary to describe the bonding satisfactorily?

A) Ozone

B) Boron trifluride

C) Water

D) Acetylene

E) Phosphorous trichloride

Correct Answer : Option A

61. The bond order of O_2 molecule and its magnetic property are respectively

A) 3, paramagnetic

B) 2, paramagnetic

C) 3, diamagnetic

D) 1.5, paramagnetic
E) 2, diamagnetic

Correct Answer : Option B

62. Which of the following 3d block element exhibits +2, +3, +4, +5, +6 and +7 oxidation states?
A) Titanium
B) Vanadium
C) Chromium
D) Manganese
E) Iron

Correct Answer : Option D

63. Which of the following explains why dimethyl ether has lower boiling point than its isomeric compound, ethanol?
A) Resonance
B) London dispersion forces
C) Hybridisation
D) Van der Waals forces
E) Hydrogen bonding

Correct Answer : Option E

64. Which lanthanide element has half-filled 4f orbitals in its +3 state?
A) Terbium
B) Gadolinium
C) Cerium
D) Lanthanum
E) Lutetium

Correct Answer : Option B

65. The IUPAC name of the co-ordination compound $[Co(NH_3)_4(H_2O)Cl]Cl_2$ is
A) Tetraammineaquachloridocobalt(III) chloride
B) Aquatetraamminechloridocobalt(III) chloride
C) Chloridotetraammineaquacobalt(II) chloride
D) Tetraamminechloridoaquacobalt(III) dichloride
E) Tetraamminechloridoaquacobalt(II) dichloride

Correct Answer : Option A

66. In which of the following reaction Lindlar's catalyst is used?
A) $CH_3\text{-}CH{=}CH\text{-}CH_3 + H_2 \rightarrow CH_3\text{-}CH_2\text{-}CH_2\text{ -}CH_3$
B) $CH_3\text{-}CO\text{-}CH_3 + H_2 \rightarrow CH_3\text{-}CH(OH)\text{-}CH_3$
C) $CH_3CH_2NO_2 + H_2 \rightarrow CH_3CH_2NH_2$
D) $C_6H_5\text{-}CHO + H_2 \rightarrow C_6H_5\text{-}CH_2OH$
E) $CH_3\text{-}C{\equiv}C\text{-}CH_3 + H_2 \rightarrow CH_3\text{-}CH{=}CH\text{ -}CH_3$

Correct Answer : Option E

67. The alkene that exhibits optical isomerism is

A) 2-methyl-2-pentene
B) 3-methyl-2-pentene
C) 3-methyl-1-pentene
D) 4-methyl-1-pentene
E) 2-methylpentane

Correct Answer : Option C

68. Which of the following cannot be prepared by the reduction of either a ketone or an aldehyde with $NaBH_4$ in methanol?

A) 2-Butanol
B) 2-Methyl 2-propanol
C) 2-Methyl 1-propanol
D) 1-Butanol
E) 2-Phenylethanol

Correct Answer : Option B

69. The following reaction

$$CH_3Br + AgF \rightarrow CH_3F + AgBr$$

is known as

A) Finkelstein reaction
B) Wurtz reaction
C) Sandmeyer's reaction
D) Williamson reaction
E) Swarts reaction

Correct Answer : Option E

70. Which is incorrect statement with regard to 1-phenylethanol?
A) It is a primary alcohol
B) It is an aromatic alcohol
C) It forms a ketone on oxidation
D) It is optically active
E) It liberates H2 when treated with metallic sodium

Correct Answer : Option A

71. In Dumas method of nitrogen estimation 0.14 g of an organic compound gave 22.4 mL of nitrogen at STP. The percentage of the nitrogen in the compound is
A) 12.5 %
B) 15 %
C) 17.5 %
D) 20 %
E) 22.5%

Correct Answer : Option D

72. Which of the following base is not present in RNA molecule?
A) Adenine
B) Guanine
C) Thymine

D) Uracil
E) Cytosine

Correct Answer : Option C

73. Which of the following carboxylic acid has the highest pKa?
A) ethanoic acid
B) chloroethanoic acid
C) fluoroethanoic acid
D) dichloroethanoic acid
E) triflouroethanoic acid

Correct Answer : Option A

74. What is the total number of sigma bonds found in the following compound?

$CH_3\text{-}CH{=}C{=}CH{-}C{\equiv}C{-}H$

A) 10
B) 11
C) 12
D) 9
E) 13

Correct Answer : Option B

75. Cheilosis disease and digestive disorders are caused by the deficiency of
A) ascorbic acid
B) thiamine
C) cyanocobalamine
D) riboflavin
E) pyridoxine

Correct Answer : Option D

76. $\int \frac{\tan^5 x \ \sec^2 x}{\tan^{12} x + 1} dx$ is equal to

A) $\frac{1}{6}\tan^{-1}\left[\tan^6 x\right] + C$
B) $\frac{1}{2}\tan^{-1}\left[\tan^6 x\right] + C$
C) $\frac{1}{4}\tan^{-1}\left[\tan^4 x\right] + C$
D) $\frac{1}{3}\tan^{-1}\left[\tan^3 x\right] + C$
E) $\frac{1}{7}\tan^{-1}\left[\tan^7 x\right] + C$

Correct Answer : Option A

77. $\int_{-\pi/2}^{\pi/2} \frac{\cos^2 x}{1+2^{-x}} dx$ is equal to

A) $\frac{\pi}{3}$

B) $\frac{\pi}{4}$

C) 1

D) $\frac{1}{2}$

E) $\frac{\pi}{2}$

Correct Answer : Option B

78. If $\left[x^2\right]$ is the greatest integer less than or equal to x^2, then $\int_0^{\sqrt{2}} \left[x^2\right] dx =$

A) $\sqrt{2}$

B) 2

C) $\sqrt{2}-1$

D) $\sqrt{2}+1$

E) $2\sqrt{2}+1$

Correct Answer : Option C

79. Real part of $\left(\frac{1+i}{1-i}\right)\left(\frac{2+i}{2-i}\right)$ is

A) $\frac{3}{5}$

B) $-\frac{3}{5}$

C) $\frac{4}{5}$

D) $-\frac{4}{5}$

E) $-\frac{1}{5}$

Correct Answer : Option D

80. Let z be a non-zero complex number such that $z = \frac{16}{\bar{z}}$. Then the locus of z is

A) a straight line

B) a parabola

C) an ellipse

D) any circle of radius 4

E) a circle with centre at the origin

Correct Answer : Option E

81. If $a^2+b^2=1$, then $\frac{1+(a-ib)}{1+(a+ib)}=$ is equal to

A) $a-ib$

B) $a+ib$

C) $-a+ib$

D) $-a-ib$

E) $b+ia$

Correct Answer : Option A

82. $\left|\left(\frac{1+i}{\sqrt{2}}\right)^{2024}\right|=$

A) 4

B) 2^{1012}

C) 1

D) $\sqrt{2}$

E) 2^{2024}

Correct Answer : Option C

83. $\int\left(x^4-8x^2+16x\right)\left(4x^3-16x+16\right)dx=$

A) $x^4+4x^3-8x^2+16x+7+C$

B) $\frac{1}{2}\left(x^4-8x^2+16x+7\right)^2+C$

C) $\frac{1}{2}\left(x^4-8x^2+16x\right)^2+C$

D) $\frac{1}{2}\left(x^4-8x^2+7\right)^2+C$

E) $\frac{1}{4}\left(x^4-8x^2+16x\right)^2+C$

Correct Answer : Option C

84. Let $[x]$ be the greatest integer less than or equal to x. Then $\lim_{x\to 0^-}\frac{x([x]+|x|)}{|x|}$ is equal to

A) -1

B) -2

C) 0

D) 1

E) 2

Correct Answer : Option D

85. If $x = 5\tan t$ and $y = 5\sec t$, then $\frac{dy}{dx}$ at $t = \frac{\pi}{3}$ is

A) $\frac{1}{2}$

B) $\frac{1}{4}$

C) $\frac{\sqrt{3}}{2}$

D) $\frac{1}{\sqrt{3}}$

E) $\sqrt{3}$

Correct Answer : Option C

86. The area bounded by the curves $y=x^2$ and $y=2x$ in the first quadrant, is equal to

A) $\frac{2}{3}$

B) $\frac{4}{3}$

C) $\frac{1}{3}$

D) $\frac{8}{3}$

E) $\frac{7}{3}$

Correct Answer : Option B

87. $\int \frac{\sec x}{(\sec + \tan x)^2} dx =$

A) $\frac{2}{5(\sec x + \tan x)^4} + C$

B) $\frac{-1}{2(\sec x + \tan x)^2} + C$

C) $\frac{2}{3(\sec x + \tan x)^{3/2}} + C$

D) $\frac{-2}{3(\sec x + \tan x)^3} + C$

E) $(\sec x + \tan x)^2 + C$

Correct Answer : Option B

88. If $\int xe^{-x} dx = Me^{-x} + C$, where C is an arbitrary constant, then M is equal to

A) -(1+x)

B) 1+x

C) -2x

D) x^2

E) 2

Correct Answer : Option A

89. The value of $\int_{-4}^{-2}\left[(x+3)^3+2+(x+3)\cos(x+3)dx\right]$ is equal to

A) 3

B) -2

C) -1

D) 1

E) 4

Correct Answer : Option E

90. $\int_{-500}^{500}\log_e\left(\frac{1000+x}{1000-x}\right)dx =$

A) 1000

B) $\log_e 1000$

C) $\log_e 500$

D) 0

E) $\frac{1}{1000}$

Correct Answer : Option D

91. When $y=vx$, the differential equation $\frac{dy}{dx}=\frac{y}{x}+\frac{f\left(\frac{y}{x}\right)}{f'\left(\frac{y}{x}\right)}$ reduces to

A) $\frac{f(v)}{f'(v)}dv=\frac{1}{x}dx$

B) $\frac{f'(v)}{f(v)}dv=xdx$

C) $\frac{f'(v)}{f(v)}dv=\frac{1}{x}dx$

D) $f'(v)f(v)dv=xdx$

E) $f'(v)f(v)dv=\frac{1}{x}dx$

Correct Answer : Option C

92. The integrating factor of $(1+2e^{-x})\frac{dy}{dx}-2e^{-x}y=1+e^{-x}$ is

A) $2e^{-x}$

B) $1+e^{-x}$

C) $1-e^{-x}$

D) $1-2e^{-x}$

E) $1+2e^{-x}$

Correct Answer : Option E

93. The solution of $e^{\frac{dy}{dx}} = x+2$ is

A) y=(x+2)log(x+2)+x+C

B) y=(x+2)log(x+2)-x+C

C) y=(x+1)log(x+1)-x+C

D) y=(x+1)log(x+1)+x+C

E) y=(x+1)log(x+1)+C

Correct Answer : Option B

94. The solution of $\frac{dy}{\cos y} = dx$ is

A) $\log\left|\sec y - \tan y\right| = x + C$

B) $x + \sec y + \tan y = C$

C) $\sec y + \tan y = x + C$

D) $\log\left|\sec x + \tan y\right| = \sec y + x + C$

E) $\log\left|\sec y + \tan y\right| = x + C$

Correct Answer : Option A

95. The solution of $(y\cos y + \sin y)\,dy = (2x\log x + x)\,dx$ is

A) $y\sin x = x^2\log x + C$

B) $y\sin y = x\log x + C$

C) $y\sin y = x^2\log x + C$

D) $\sin x = x^2\log x + C$

E) $y\sin x = x\log x + C$

Correct Answer : Option C

96. The area enclosed by the curve $x = 3\cos\theta,\ y = 5\sin\theta,\ 0 \le \theta \le 2\pi$, is equal to

A) 15π

B) 2π

C) 4π

D) 8π

E) 10π

Correct Answer : Option A

97. $\lim_{x\to 0}\frac{\sin\left(\pi\sin^2 x\right)}{x^2}$ is equal to

A) 2π

B) π^2

C) $2\pi^2$

D) $\frac{\pi}{2}$

E) π

Correct Answer : Option E

98. If $\lim_{x\to 1}\frac{x^2-ax-b}{x-1}=5$, then $a+b=$

A) 0

B) 5

C) -1

D) -5

E) 1

Correct Answer : Option E

99. $\int\frac{dx}{x^8\left(\frac{1}{x^7}+1\right)^{2/3}}$ is equal to

A) $\frac{3}{7}\left(\frac{1}{x^7}+1\right)^{2/3}+C$

B) $-\frac{3}{7}\left(\frac{1}{x^7}+1\right)^{2/3}+C$

C) $-\frac{3}{7}\left(\frac{1}{x^7}+1\right)^{1/3}+C$

D) $\frac{3}{7}\left(\frac{1}{x^7}+1\right)^{1/3}+C$

E) $\frac{7}{3}\left(\frac{1}{x^7}+1\right)^{2/3}+C$

Correct Answer : Option C

100. The value of $\int_0^{\pi/2}\frac{\cos^{2024}x}{\sin^{2024}x+\cos^{2024}x}$ is equal to

A) $\frac{\pi}{4}$

B) $\frac{\pi}{2}$

C) 2π

D) π

E) $\frac{\pi}{3}$

Correct Answer : Option A

101. Let $\mathbb{N}$ be the set of all natural numbers. Let R be a relation defined on $\mathbb{N}$ given by aRb if and only if $a+2b=11$. Then the relation R is

A) reflexive but not symmetric
B) not reflexive but symmetric
C) reflexive and symmetric
D) neither reflexive nor symmetric
E) an equivalence relation

Correct Answer : Option D

102. If $R=\{(x,y):x,y\in\mathbb{Z},\ x^2+3y^2\le 7\}$ is a relation on the set of integers $\mathbb{Z}$, then the range of the relation R is

A) {0,1}
B) {1,-1}
C) {0,-1}
D) {1}
E) {0,-1,1)

Correct Answer : Option E

103. Let $f(x)=|\sin x|+|\cos x|,\ x\in\mathbb{R}$. The period of $f(x)$ is

A) 2π
B) π
C) $\frac{\pi}{4}$
D) $\frac{\pi}{2}$
E) $\frac{3\pi}{2}$

Correct Answer : Option D

104. Let a, b, c be positive numbers such that abc=1. Then the minimum value of a+b+c is

A) 8
B) 4
C) 6
D) 2
E) 3

Correct Answer : Option E

105. The coefficient of x^3 in the expansion of $\frac{1}{(1+2x)^{-10}}$, is

A) 980
B) 960

C) 1020
D) 860
E) 880

Correct Answer : Option B

106. The sum upto n terms of $\frac{1}{\sqrt{1}+\sqrt{6}}+\frac{1}{\sqrt{6}+\sqrt{11}}+\ldots$ is

A) $\frac{1}{5}\left[\sqrt{5n+1}\right]$

B) $\frac{1}{5}\left[\sqrt{5n+1}+1\right]$

C) $\frac{1}{5}\left[\sqrt{5n+1}-1\right]$

D) $\frac{1}{6}\left[\sqrt{6n+1}\right]$

E) $\frac{1}{7}\left[\sqrt{7n+1}-1\right]$

Correct Answer : Option C

107. $\sum_{n=1}^{24}\left(i^n+i^{n+1}\right)=$

A) $1+i$

B) i

C) $1-i$

D) 0

E) 1

Correct Answer : Option D

108. Number of integers greater than 7000 can be formed using the digits 2,4,5,7,8 is (Repetition of digits is not allowed)

A) 120
B) 168
C) 144
D) 108
E) 124

Correct Answer : Option B

109. The coefficient of x^{17} in $(1-x)^{13}\left(1+x+x^2\right)^{12}$ is

A) ${}^{12}C_6$

B) ${}^{9}C_7$

C) 0

D) 1

E) ${}^{12}C_4$

Correct Answer : Option C

110. Let A be a symmetric matrix and B be a skew symmetric. If $A+B=\begin{pmatrix}1 & 3\\ -2 & 5\end{pmatrix}$, then $A-B$ is equal to

A) $\begin{pmatrix}1 & 3\\ -2 & 5\end{pmatrix}$

B) $\begin{pmatrix}1 & -2\\ 3 & -5\end{pmatrix}$

C) $\begin{pmatrix}1 & -2\\ -3 & -5\end{pmatrix}$

D) $\begin{pmatrix}1 & -2\\ 3 & 5\end{pmatrix}$

E) $\begin{pmatrix}-1 & 3\\ 2 & -5\end{pmatrix}$

Correct Answer : Option D

111. If $A=\begin{pmatrix}x & 2\\ 2 & x\end{pmatrix}$ and $\det\left(A^2\right)=25$, then x is equal to

A) ± 3

B) ± 1

C) ± 2

D) ± 4

E) ± 5

Correct Answer : Option A

112. If $\theta\in\left(0,\frac{\pi}{3}\right)$ and $\begin{vmatrix}0 & -\sin^2\theta & -2-4\cos 6\theta\\ 0 & \cos^2\theta & -2-4\cos 6\theta\\ 1 & \sin\theta & \cos 2\theta\end{vmatrix}=0$, then θ is equal to

A) $\frac{\pi}{18}$

B) $\frac{\pi}{6}$

C) $\frac{\pi}{2}$

D) $\frac{\pi}{9}$

E) $\frac{\pi}{5}$

Correct Answer : Option D

113. If $\begin{vmatrix} x & 2 & -1 \\ 1 & x & 5 \\ 3 & 2 & x \end{vmatrix} = 0$, then the real value of x is

A) 4
B) -3
C) 2
D) -1
E) -4

Correct Answer : Option E

114. Let $A = \begin{pmatrix} 0 & 1 \\ -1 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 1 \\ -1 & -1 \end{pmatrix}$. If $XA = B$, then X is

A) $\begin{pmatrix} -3 & -1 \\ 1 & 1 \end{pmatrix}$

B) $\begin{pmatrix} -3 & 1 \\ 3 & -1 \end{pmatrix}$

C) $\begin{pmatrix} 3 & -1 \\ -3 & 1 \end{pmatrix}$

D) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

E) $\begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix}$

Correct Answer : Option C

115. The value of $\sin^6 15^\circ + \cos^6 15^\circ$ is equal to

A) $\frac{13}{16}$

B) $\frac{11}{16}$

C) $\frac{9}{16}$

D) $\frac{7}{16}$

E) $\frac{5}{16}$

Correct Answer : Option A

116. $\left(1+\cos\frac{\pi}{8}\right)\left(1+\cos\frac{7\pi}{8}\right) =$

A) $\frac{1}{\sqrt{2}}\left(1+\sqrt{2}\right)$

B) $\frac{1}{2\sqrt{2}}\left(1+\sqrt{2}\right)$

C) $\frac{1}{2\sqrt{2}}\left(\sqrt{2}-1\right)$

D) $\frac{1}{\sqrt{2}}\left(\sqrt{2}-1\right)$

E) $\frac{1}{2}\left(\sqrt{2}+1\right)$

Correct Answer : Option C

117. $\cos A\cos 2A$ is equal to

A) $\frac{\sin 4A}{4\sin A}$

B) $\frac{\sin 2A}{2\sin A}$

C) $\frac{\cos 2A}{\sin 3A}$

D) $\frac{\sin 2A}{\sin A}$

E) $\frac{\sin 4A}{2\sin A}$

Correct Answer : Option A

118. $\frac{\sin 7x+\sin 5x}{\cos 7x+\cos 5x}=$

A) $\frac{\tan 6x}{\sin 6x}$

B) $\frac{\tan 6x}{\cos 6x}$

C) $\sin 6x$

D) $\cos 6x$

E) $\tan 6x$

Correct Answer : Option E

119. $\left(\sec A-\cos A\right)\left(\tan A-\cot A\right)=$

A) $\sin A\left(1-\tan^2 A\right)$

B) $-\sin A\left(1-\tan^2 A\right)$

C) $\cos A\left(1+\cot^2 A\right)$

D) $-\cos A\left(1+\cot^2 A\right)$

E) $1-\tan^2 A$

Correct Answer : Option B

120. If $\sec(\alpha+\beta)=\frac{\sqrt{7}}{\sqrt{3}}$, then $\sin(\alpha+\beta)+\tan(\alpha+\beta)=$

A) $\frac{\sqrt{3}+\sqrt{7}}{\sqrt{21}}$

B) $\frac{2}{\sqrt{21}}$

C) $\frac{2\left(\sqrt{3}+\sqrt{7}\right)}{\sqrt{21}}$

D) $\frac{\sqrt{7}}{\sqrt{3}}$

E) $\frac{\sqrt{3}}{\sqrt{7}}$

Correct Answer : Option C

121. If $\sin^{-1}x+\sin^{-1}y+\sin^{-1}z=\frac{3\pi}{2}$, then $x+y+z=$

A) 2
B) 8
C) 4
D) 6
E) 3

Correct Answer : Option E

122. $\cos 18^\circ \cos 42^\circ \cos 78^\circ =$

A) $\frac{1}{4}\cos 36^\circ$

B) $\frac{1}{4}\cos 72^\circ$

C) $\frac{1}{4}\sin 72^\circ$

D) $\frac{1}{4}\sin 36^\circ$

E) None of the above

Correct Answer : Option D

123. If a and b are A.M. and G.M. of x and y respectively, then x^2+y^2 is equal to

A) $4a^2-2b^2$
B) $4a^2-b^2$

C) $2a^2-3b^2$

D) a^2-2b^2

E) $4a^2-3b^2$

Correct Answer : Option A

124. If $\sin^{-1}x+\cos^{-1}y=0$, then x^2+y^2 is equal to

A) $\frac{1}{2}$

B) $\sqrt{2}$

C) 1

D) $\frac{1}{\sqrt{2}}$

E) 2

Correct Answer : Option C

125. $\sin\left(2\sin^{-1}\left(\frac{1}{2}\right)\right)=$

A) $\sqrt{3}$

B) $\frac{\sqrt{3}}{2}$

C) $\frac{\sqrt{3}}{4}$

D) $-\sqrt{3}$

E) $\frac{1}{\sqrt{3}}$

Correct Answer : Option B

126. $\sin^{-1}\left(\sin\left(\frac{5\pi}{6}\right)\right)=$

A) $\frac{5\pi}{6}$

B) $\frac{\pi}{2}$

C) $\frac{\pi}{3}$

D) $\frac{\pi}{12}$

E) $\frac{\pi}{6}$

Correct Answer : Option E

127. If $|x| \le 1$, then $\sin\left(2\sin^{-1}x + \cos^{-1}x\right)$ is equal to

A) $\sqrt{1-x^2}$

B) $\dfrac{1}{\sqrt{1-x^2}}$

C) x^2

D) x

E) $\dfrac{x}{2}$

Correct Answer : Option A

Let x and y be two positive real numbers. Then

128. $\left(x+\dfrac{1}{x}\right)\left(y+\dfrac{1}{y}\right)$ is greater than or equal to

A) 3

B) 2

C) 4

D) 5

E) 6

Correct Answer : Option C

Let $\vec{a}$ and $\vec{b}$ be two unit vectors. Let θ be the angle between $\vec{a}$ and $\vec{b}$. If $\theta \neq 0$ or π, then

129. $\left|\vec{a}-\left(\vec{a}\cdot\vec{b}\right)\vec{b}\right|^2$ is equal to

A) $\cos^2\theta$

B) $\sin^2\theta$

C) $\tan^2\theta$

D) 1

E) $2\cos^2\theta$

Correct Answer : Option B

130. Let $\overrightarrow{AB} = \hat{i}+2\hat{j}-2\hat{k}$ and $\overrightarrow{AC} = \hat{i}-\hat{j}+\hat{k}$. Then the area of ΔABC is

A) $3\sqrt{2}$

B) $\dfrac{3}{2}$

C) $2\sqrt{3}$

D) $\dfrac{3}{\sqrt{2}}$

E) $\dfrac{1}{\sqrt{2}}$

Correct Answer : Option D

131. The centre of the circle (x-3)(x+1)+(y-1)(y+3)=0 is

A) (3,1)

B) (-1,-3)

C) (3,-3)

D) (-1,1)

E) (1,-1)

Correct Answer : Option E

132. The length of latus rectum of the parabola $y^2 = x$ is

A) $\frac{1}{4}$

B) $\frac{1}{2}$

C) 4

D) 1

E) 2

Correct Answer : Option D

133. The volume of the parallelopiped whose coterminus are given by the vectors $\hat{i} - \hat{j} + \hat{k},\ 3\hat{i} + \hat{j} - \hat{k},\ 5\hat{i} + 2\hat{j} - 7\hat{k}$ is (in cubic units)

A) 15

B) 20

C) 16

D) 18

E) 22

Correct Answer : Option B

134. Let $\vec{a} = 2\hat{i} + 3\hat{j} - 4\hat{k},\ \vec{b} = \hat{i} + \hat{j} - \hat{k},\ \vec{c} = -\hat{i} + 2\hat{j} + 3\hat{k},\ \vec{d} = \hat{i} + \hat{j} + \hat{k}$. Then $\left(\vec{a} \times \vec{b}\right) \cdot \left(\vec{c} \times \vec{d}\right) =$

A) -5

B) -4

C) -3

D) -6

E) -8

Correct Answer : Option D

135. If α, β, γ are the angles made by $\frac{x-1}{3} = \frac{y+1}{2} = -z$ with the coordinate axes, then $(\cos\alpha, \cos\beta, \cos\gamma) =$

A) $\left(\frac{3}{\sqrt{14}}, \frac{2}{\sqrt{14}}, \frac{-1}{\sqrt{14}}\right)$

B) $\left(\frac{3}{\sqrt{7}}, \frac{-2}{\sqrt{7}}, \frac{-1}{\sqrt{7}}\right)$

C) $\left(\frac{3}{\sqrt{14}}, \frac{-2}{\sqrt{14}}, \frac{-1}{\sqrt{14}}\right)$

D) $\left(\frac{3}{\sqrt{7}},\frac{2}{\sqrt{7}},\frac{-1}{\sqrt{7}}\right)$

E) $\left(\frac{-3}{\sqrt{14}},\frac{-2}{\sqrt{14}},\frac{-1}{\sqrt{14}}\right)$

Correct Answer : Option A

136. The common point of the two straight lines $\vec{r}=\left(\hat{i}-2\hat{j}+3\hat{k}\right)+s\left(2\hat{i}+\hat{j}+\hat{k}\right)$ and $\vec{r}=\left(-\hat{i}+2\hat{j}+7\hat{k}\right)+t\left(\hat{i}+\hat{j}+\hat{k}\right),\ t,s\in\mathbb{R}$ is

A) (11,8,-3)
B) (-11,-8,-3)
C) (11,-8,3)
D) (11,-8,-3)
E) (9,8,-3)

Correct Answer : Option B

137. The angle between the two straight lines $\vec{r}=\left(4\hat{i}-\hat{k}\right)+t\left(2\hat{i}+\hat{j}-2\hat{k}\right),\ t\in\mathbb{R}$ and $\vec{r}=\left(\hat{i}-\hat{j}+2\hat{k}\right)+s\left(2\hat{i}-2\hat{j}+\hat{k}\right),\ s\in\mathbb{R}$ is

A) $\frac{\pi}{4}$
B) $\frac{\pi}{3}$
C) $\frac{\pi}{6}$
D) 0
E) $\frac{\pi}{2}$

Correct Answer : Option E

138. The shortest distance between the parallel straight lines $\vec{r}=\hat{j}+t\left(\hat{i}+\hat{j}\right)$ and $\vec{r}=\hat{k}+s\left(\hat{i}+\hat{j}\right),\ t,s\in\mathbb{R}$ is

A) $\sqrt{3}$
B) $\frac{\sqrt{3}}{2}$
C) $\frac{\sqrt{3}}{\sqrt{2}}$
D) $\frac{1}{\sqrt{2}}$
E) $\frac{1}{\sqrt{3}}$

Correct Answer : Option C

139. If $\vec{a}$ and $\vec{b}$ are two unit vectors and if $\frac{\pi}{4}$ is the angle between $\vec{a}$ and $\vec{b}$, then $\left(\vec{a}+\left(\vec{a}.\vec{b}\right)\vec{b}\right).\left(\vec{a}-\left(\vec{a}.\vec{b}\right)\vec{b}\right)$ is equal to

A) $\frac{1}{4}$

B) $\frac{3}{4}$

C) $\frac{3}{2}$

D) $\frac{1}{2}$

E) $\frac{5}{4}$

Correct Answer : Option D

140. If $\vec{a}$ and $\vec{b}$ are two nonzero vectors and if $\left|\vec{a}\times\vec{b}\right|=\left|\vec{a}.\vec{b}\right|$, then the angle between $\vec{a}$ and $\vec{b}$ is equal to

A) $\frac{\pi}{2}$

B) $\frac{\pi}{4}$

C) $\frac{\pi}{3}$

D) $\frac{\pi}{6}$

E) $\frac{2\pi}{3}$

Correct Answer : Option B

141. The symmetric form of the equation of the straight line $\vec{r}=\hat{i}+t\hat{j}, t\in\mathbb{R}$, is

A) $\frac{x-1}{0}=\frac{y}{1}=\frac{z}{0}$

B) $\frac{x}{1}=\frac{y}{1}=\frac{z-1}{0}$

C) $\frac{x-1}{0}=\frac{y-1}{0}=\frac{z}{1}$

D) $\frac{x-1}{1}=\frac{y}{1}=\frac{z}{0}$

E) $\frac{x-1}{0}=\frac{y}{1}=\frac{z}{1}$

Correct Answer : Option A

142. If $\vec{a} = \alpha\hat{i} + \beta\hat{j}$ and $\vec{b} = \alpha\hat{i} - \beta\hat{j}$ are perpendicular, where $\alpha \neq \beta$, then $\alpha + \beta$ is equal to

A) $\alpha\beta$

B) $\alpha - \beta$

C) $\dfrac{1}{\alpha - \beta}$

D) $\dfrac{1}{2\alpha\beta}$

E) 0

Correct Answer : Option E

143. Three dice are thrown simultaneously. The probability that all the three outcomes are same number, is

A) $\dfrac{1}{6}$

B) $\dfrac{1}{216}$

C) $\dfrac{1}{72}$

D) $\dfrac{1}{36}$

E) $\dfrac{5}{36}$

Correct Answer : Option D

144. Let A and B be two events such that $P(A) = 0.4$, $P(B) = 0.5$ and $P(A \cap B) = 0.1$. Then $P(A / \overline{B}) =$

A) $\dfrac{1}{5}$

B) $\dfrac{2}{5}$

C) $\dfrac{4}{5}$

D) $\dfrac{3}{5}$

E) $\dfrac{1}{3}$

Correct Answer : Option D

145. $\dfrac{1+\cos\left(\frac{\pi}{5}\right)+i\sin\left(\frac{\pi}{5}\right)}{1+\cos\left(\frac{\pi}{5}\right)-i\sin\left(\frac{\pi}{5}\right)}$ is equal to

A) $\cos\left(\frac{\pi}{5}\right)+i\sin\left(\frac{\pi}{5}\right)$

B) $\cos\left(\frac{\pi}{5}\right)-i\sin\left(\frac{\pi}{5}\right)$

C) $\sin\left(\frac{\pi}{5}\right)+i\cos\left(\frac{\pi}{5}\right)$

D) $\sin\left(\frac{\pi}{5}\right)-i\cos\left(\frac{\pi}{5}\right)$

E) $\cos\left(\frac{\pi}{5}\right)$

Correct Answer : Option A

146. If $x \neq 0, y \neq 0$, then the value of $\cot^{-1}\left(\frac{x}{y}\right)+\cot^{-1}\left(\frac{y}{x}\right)$ is

A) π

B) $\frac{\pi}{2}$

C) 0

D) $-\pi$

E) $-\frac{\pi}{2}$

Correct Answer : Option B

147. If z is a complex number of unit modulus, then $\left|\frac{1+z}{1+\bar{z}}\right|$ equals

A) 2

B) 1

C) $\frac{1}{2}$

D) 4

E) 6

Correct Answer : Option B

148. The solution of the inequality $|3x-4| \leq 5$ is

A) $\left[-\frac{1}{3}, 3\right]$

B) $[-1,4]$

C) $[1,\infty)$

D) $[-1,1]$

E) $[0,1]$

Correct Answer : Option A

149. Variance of 6,7, 8, 9 is

A) $\frac{1}{4}$

B) $\frac{3}{4}$

C) $\frac{2}{3}$

D) $\frac{1}{3}$

E) $\frac{5}{4}$

Correct Answer : Option E

150. If $f(x)=\frac{|x|}{1+|x|}$, $x \in \mathbb{R}$, then $f'(-2)$ is equal to

A) $\frac{-7}{9}$

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

C) $\frac{-4}{9}$

D) $\frac{-1}{3}$

E) $\frac{-3}{7}$

Correct Answer : Option B