aglasem.com

Q.B. Series: **C**

Common Entrance Test (Engineering) -2018
QUESTION BOOKLET

Q.B. Number: 300871

INSTRUCTIONS

Maximum Time Allowed : 3 Hours
Negative Marking : 0.25 Marks

No. of Questions: 180
Maximum Marks: 180

Roll Number: _____ Answer Sheet Number: _____

Please read the following instructions carefully:

1) **Check the booklet thoroughly**: In case of any defect – Misprint, missing question(s) or duplication of question(s) / Page(s), get the booklet changed with the booklet of the same series from the Room Invigilator. No complaint shall be entertained after the entrance test is over.

2) Write your Roll Number and the OMR Answer Sheet Number on the question booklet.

3) Mark carefully your Roll Number, Question Booklet Number, Paper Code, Question Booklets series and Course on the OMR Answer sheet and sign at the appropriate place. Candidates shall be personally responsible for any mistake committed in making these entries in the OMR Answer Sheet. Board shall under no circumstances be responsible for any such mistake.

4) Strictly follow the instructions given by the Centre Supervisor / Room Invigilator and those given on the Question Booklet.

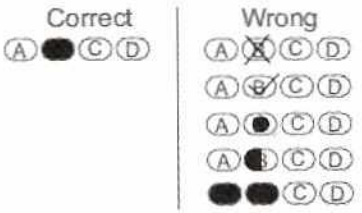
5) Candidates are not allowed to carry any papers, notes, books, calculators, cellular phones, scanning devices, pagers etc. to the Examination Hall. Any candidate found using, or in possession of such unauthorized material, indulging in copying or impersonation or adopting unfair means / reporting late / without Admit Card will be debarred from the written test.

6) Please mark the right responses on the OMR Sheet with ONLY a Blue/Black ball point pen. Use of eraser, whitener (fluid) and cutting on the OMR Answer Sheet is NOT allowed.

7) The test is of objective type containing multiple choice questions (MCQs). Each objective question is followed by four responses. Your task is to choose the correct/best response and mark your response on the OMR Answer Sheet and NOT on the Question Booklet.

8) There will be negative marking of 0.25 marks for every wrong answer.

9) For marking response to a question, completely darken the CIRCLE so that the alphabet inside the CIRCLE is not visible. Darken only ONE circle for each question. If you darken more than one circle, it will be treated as wrong answer. The CORRECT and the WRONG methods of darkening the CIRCLE on the OMR Answer Sheet are shown below.



10) Please be careful while marking the response to questions. The response once marked cannot be changed and if done shall be treated as wrong answer.

11) In view of the tight time span, do NOT waste your time on a question which you find to be difficult.

12) DO NOT make any stray marks anywhere in or around the oval on the OMR Answer Sheet. It will be read as double shading and will make answer invalid. DO NOT fold or wrinkle the OMR Answer Sheet.

13) Rough work MUST NOT be done on the OMR Answer Sheet. Use your test booklet for this purpose.

14) Candidates are provided carbonless OMR Answer Sheet having original copy and candidate's copy. After completing the examination, candidates are directed to fold at perforation on the top of the sheet, tear it to separate original copy and candidate's copy and then hand over the original copy of OMR Answer Sheet to the Room Invigilator and take candidate's copy with them.

DO NOT OPEN THE SEAL OF THIS BOOKLET UNTIL TOLD TO DO SO

docs.aglasem.com
aglasem.com

Section 1 - Physics

1) If a particle moves in a curved path, it must have a component of acceleration

A) perpendicular to the mass

B) perpendicular to the gravity

C) perpendicular to the velocity

D) parallel to the velocity

---

2) When an object is placed between pole and focus of a concave mirror, then the images formed are

A) real, erect and magnified

B) virtual, erect and magnified

C) virtual, erect and non- magnified

D) virtual, erect and diminished

---

3) The property of the substance which shows how easily a substance can be magnetized, when placed in a magnetic field is called

A) Magnetic Susceptibility

B) Magnetic flux density

C) Magnetic Permeability

D) Magnetic Field

---

4) Order of magnitude of a physical quantity is the

A) Power of 5 of the number that describes the quantity

B) Power of 10 of the number that describes the quantity

C) Power of 100 of the number that describes the quantity

D) Power of 0.01 of the number that describes the quantity

---

5) Which wave or ray is produced due to decelerating or accelerating charged particles?

A) Microwaves

B) Ultraviolet rays

C) Infrared rays

D) X-Rays

6) Which is the INCORRECT statement regarding electric lines of force

A) Electric lines of force never intersects with each other

B) Electric lines of force are always perpendicular to equipotential surface

C) Electric lines of force start from positive charge and terminates on negative charge

D) Electric lines of force are always parallel to equipotential surface

---

7) The molecule of a monatomic gas has

A) Only one translational degree of freedom

B) Only two translational degrees of freedom

C) Only three translational degrees of freedom

D) No translational degrees of freedom at all

---

8) The force of attraction between two Lead balls, of radius 10 cm and 1 cm that are placed with their centres 1 metre apart is (The density of Lead is 5.51×10^3 kg/m^3.)

A) 3.5×10^{-11} N

B) 0.35×10^{-11} N

C) 35×10^{-11} N

D) 350×10^{-11} N

---

9) Work done in displacing a Magnetic Dipole of magnetic moment M, (Bar Magnet) in Uniform Magnetic Field B from an angle θ_1 to θ_2 is

A) $W = B (\cos \theta_1 - \cos \theta_2) / M$

B) $W = M (\cos \theta_1 - \cos \theta_2) / B$

C) $W = M B (\cos \theta_1 + \cos \theta_2)$

D) $W = M B (\cos \theta_1 - \cos \theta_2)$

---

10) An object approaches a convergent lens from the left of the lens with a uniform speed 10 m/s and stops at the focus. The image moves

A) away from the lens with an uniform speed 10 m/s

B) away from the lens with an uniform acceleration of 10m/s^2

C) away from the lens with a non-uniform acceleration

D) towards the lens with a non-uniform acceleration

docs.aglasem.com

aglasem.com

11) Nucleons are a collection of
A) electrons and protons
B) electron and neutrons
C) protons and neutrons
D) protons and positrons

12) What is lateral shift with respect to optics?
A) The parallel distance between the incident ray and the emergent ray
B) The perpendicular distance between the incident ray and the emergent ray
C) The perpendicular distance between the incident ray and the reflected ray
D) The parallel distance between the incident ray and the reflected ray

13) Due to atmospheric refraction effects, the day becomes longer by
A) 4 minutes
B) 0 minute
C) 2 minutes
D) 1 minute

14) No work is done on the system, but q amount of heat is taken out from the system and given to the surroundings. Express the change in internal energy (ΔU) of this system and what type of wall does the system have?
A) $\Delta U = w$, wall is adiabatic
B) $\Delta U = q - w$, closed system
C) $\Delta U = -q$, thermally conducting walls
D) $\Delta U = q$, thermally conducting walls

15) Naturally oscillating systems undergo
A) Simple Harmonic Motion (SHM)
B) 2 Dimensional Circular Motion
C) Accelerating Motion
D) Continuous Motion

16) The device or substances which **DO NOT** obey ohm's law is/are
A) Copper
B) Crystal rectifiers
C) Iron
D) Resistors

17) If the mains voltage is 230 V, then the peak voltage approximately is
A) 230 V
B) 162 V
C) 325 V
D) 330 V

18) Focal length, radius of curvature and power of a plane mirror respectively are
A) infinity, infinity and zero
B) infinity, infinity and infinity
C) zero, zero and finite
D) finite, zero, zero

19) A cyclist comes to a skidding stop in 10 m. During this process, the force on the cycle due to the road is 200 N and is directly opposed to the motion. How much work does the road do on the cycle ?
A) 2000 J
B) -2000 J
C) 20 J
D) - 20 J

20) Law that proves that different masses accelerate to the earth at the same rate, but with different forces is
A) Newton's first law
B) Newton's second law
C) Newton's third law
D) Combination of Newton's first and third law

docs.aglasem.com
aglasem.com

21) My friend has a Banjo clock. It has a pendulum. For every 1.0 sec the pendulum performs one full swing. If an object at the end of the string weighs 10.0 N, what is the length of the pendulum?

A) 0.25 m

B) 2.5 m

C) 0.5 m

D) 0.15 m

---

22) The system that returns to equilibrium as quickly as possible without oscillating is

A) Overdamped

B) Critically damped

C) Underdamped

D) Undamped

---

23) What modulation index and side bands are produced when a message of frequency 10 KHz and peak voltage of 10 volts is used to modulate a carrier frequency of 1 MHz and peak voltage of 20 volts?

A) Modulation index is 1. The side bands are 1010 - 990 KHz

B) Modulation index is 0.5. The side bands are 1010 - 990 KHz

C) Modulation index is 2. The side bands are 1020 - 980 KHz

D) Modulation index is 0.5. The side bands are 1020 - 980 KHz

---

24) Galvanometer can be converted into ammeter by

A) low resistance called shunt resistance in parallel to the galvanometer

B) very large resistance in parallel to the galvanometer

C) series connection with a very small resistance

D) series connection with a very high resistance

---

25) In a semiconductor, the concentration of minority carriers depends mainly on

A) the extent of doping

B) temperature

C) the applied bias current

D) voltage

26) Which of the following properties is NOT true for electromagnetic waves?

A) The waves are transverse in nature

B) The waves are longitudinal in nature

C) The waves propogates through space with the speed of light

D) The energy in electromagnetic wave is divided equally between electric fields and magnetic field vectors

---

27) If a point charge q is moving in a circle of radius r with speed v, then time period T of the point charge will be

A) $T=2 \pi r / v$

B) $T=2 \pi r * v$

C) $T= \pi r / 2v$

D) $T= \pi r / v$

---

28) The value of magnetic quantum number of the last electron of "**Na**" is

A) 3

B) 2

C) 1

D) 0

---

29) The minimum negative potential given to anode plate at which photoelectric current becomes zero is called

A) Compton Effect

B) Stopping Potential

C) Moseley's Law

D) Photoelectric Effect

---

30) A primary coil is connected with an AC source and a bulb is connected with the secondary coil. The voltage across the bulb is 6.0 V and the current through the bulb is 0.4 A, The turns ratio is 5:1 ($N_P : N_S = 5 : 1$). Calculate the current in the primary coil.

A) 8 A

B) 0.8 A

C) 12.5 A

D) 1.25 A

docs.aglasem.com

aglasem.com

31) Two small charged spheres have charges of 2×10^{-7} C and 3×10^{-7} C. They are placed 30 cm apart in air. What is the force between them?

A) $F=6 \times 10^{-3}$ N

B) $F=0.6 \times 10^{-3}$ N

C) $F=6.5 \times 10^{-3}$ N

D) $F=0.65 \times 10^{-3}$ N

32) The net electric charge enclosed by a Gaussian surface of dipole is

A) 0 C

B) 1 C

C) 2 C

D) 3 C

33) Which of these statements is true regarding photoelectric emission?

A) Number of photoelectrons ejected per second is directly proportional to intensity of incident light provided the frequency of incident light is greater than threshold frequency

B) Number of photoelectrons ejected per second is inversely proportional to intensity of incident light provided the frequency of incident light is greater than threshold frequency

C) Number of photoelectrons ejected per second is directly proportional to intensity of incident light provided the frequency of incident light is smaller than threshold frequency

D) Number of photoelectrons ejected per second is inversely proportional to intensity of incident light provided the frequency of incident light is smaller than threshold frequency

34) The "Uplink" satellite communication frequency bands of "C" band are

A) 5.925 - 6.425 GHz

B) 3.7 - 4.2 GHz

C) 5.925 - 6.425 MHz

D) 3.7 - 4.2 MHz

35) The resistance of a conductor does NOT depend on

A) Length and temperature of the conductor

B) Area of cross-section of the conductor

C) Material of the conductor

D) Weight of the conductor

36) The three types of expansion that takes place in solid are

A) Linear Expansion, Superficial Expansion and Cubical Expansion.

B) Volume Expansion, Real expansion and Linear Expansion

C) Apparent Expansion, Volume Expansion and Real expansion.

D) Linear Expansion, Superficial Expansion and Pressure Coefficient Expansion.

37) What is the reason for earth NOT moving towards the moon, even though moon attracts the earth?

A) The mass of the earth is much larger than the mass of the moon, it accelerates at a rate lesser than the acceleration rate of the moon towards the earth

B) The mass of the moon is much larger than the mass of the earth, it accelerates at a rate lesser than the acceleration rate of the earth towards the Moon

C) The mass of the Earth is similar to that of the moon, and both accelerate at a same rate

D) Both experience unequal gravitational forces from each other

38) Magnetic energy density in an inductor is given by

A) $U_B = B^2 / 2\mu_0$

B) $U_B = B^2 * 2\mu_0$

C) $U_B = 2B^2 / \mu_0$

D) $U_B = B^2 + 2\mu_0$

docs.aglasem.com

aglasem.com

39) The resistance of the platinum wire of a platinum resistance thermometer at the ice point is 5 Ω and at steam point is 5.23 Ω. When the thermometer is inserted in a hot bath, the resistance of the platinum wire will be 5.795 Ω. Calculate the temperature of the bath.

A) 3.456 °C

B) 34.565 °C

C) 345.65 °C

D) 45.65 °C

40) A ball is thrown horizontally from a height of 100 m with an initial speed of 15 m/s. How far does it travel horizontally in the first 2 seconds?

A) 3 m

B) 7.5 m

C) 30 m

D) 0.3 m

41) Silicon dioxide layer is found in which of the following devices?

A) NPN transistor

B) Tunnel diode

C) JFET

D) MOSFET

42) The intrinsic carrier concentration of silicon sample at 300 K is 1.5 x $10^{16}/m^3$. What is the density of minority carrier? (after doping, the number of majority carriers is 5 x $10^{20}/m^3$)

A) 4.5 x $10^{11}/m^3$

B) 3.33 x $10^{4}/m^3$

C) 5 x $10^{20}/m^3$

D) 3 x $10^{-5}/m^3$

43) In a bar magnet, the ratio of magnetic length to geometrical length is nearly

A) 0.74

B) 0.80

C) 0.84

D) 0.94

44) A small town is located 10 km away from a power plant. An average of 120 kW of electric power is sent to this town. The transmission lines have a total resistance of 0.40 Ω. Calculate the power loss, if the power is transmitted at 240 V.

A) 100 W

B) 10 W

C) 100 kW

D) 10 kW

45) A system has two charges $q_A = 2.5 \times 10^{-7}$ C and $q_B = -2.5 \times 10^{-7}$ C located at points A: (0, 0, -15 cm) and B: (0,0, +15 cm), respectively. What is the magnitude and direction of electric dipole moment of the system?

A) 7.5×10^{-8} cm, from positive to negative charge

B) 0.75×10^{-8} cm, from negative to positive charge

C) 7.5×10^{-8} cm, from negative to positive charge

D) 0.75×10^{-8} cm, from positive to negative charge

46) What is the moment of inertia of a ring about a tangent to the circle in the plane of a ring?

A) MR^2

B) 2 MR^2

C) (3/2) MR^2

D) (1/2) MR^2

47) The three central concepts in Newtonian mechanics are

A) Mass, Motion and Gravity

B) Mass, Motion and Force

C) Weight, speed and Gravity

D) Force, Mass and Acceleration

48) For a copper block, find the electric field which can give, on an average, 1 eV energy to a conduction electron.(The mean free path of conduction electrons in copper is given as 4 x 10^{-8} m)

A) 2.62 x 10^7 V/m

B) 2.64 x 10^7 V/m

C) 2.5 x 10^7 V/m

D) 2.58 x 10^7 V/m

docs.aglasem.com

aglasem.com

49) Dispersion without deviation is produced by two thin (small angled) prisms which are combined together. One prism has angle 5° and refractive index 1.56. If the other prism has refractive index 1.7, what is its angle?

A) 3°

B) 4°

C) 5°

D) 6°

50) Considering the fact that the speed of light in glass is not independent of the colour of light, which of the statement is true?

A) violet light travels slower than red light

B) violet light travels faster than red light

C) violet light travels same as red light

D) only white light will be travelling.

51) Which one of the following is NOT emitted by radioactive elements?

A) Alpha Rays

B) Beta Rays

C) Delta Rays

D) Gamma Rays

52) The phenomenon that occurs when the frequency of forced vibrations on an object matches the natural frequency of that object, and produces a dramatic increase in amplitude is called

A) Resonance

B) Beats

C) Forced vibration

D) Damping

53) Why there are two propellers in a helicopter?

A) Due to conservation of linear momentum, the helicopter itself would have turned in the opposite direction, if it had only one propeller

B) Due to conservation of angular momentum, the helicopter itself would have turned in the opposite direction, if it had only one propeller

C) The helicopter can't rise up with one

D) The helicopter would not gain speed with one

54) What is the amount of heat needed to raise the temperature of the gas in a cylinder of fixed capacity (44.8 litres) that contains helium gas at standard temperature and pressure, by 15.0 °C ?
($R = 8.31\ J\ mol^{-1}\ K^{-1}$).

A) 374 J

B) 37.4 J

C) 5.42 J

D) 54.2 J

55) The equation ($\tan \theta = B2 / B1$), where B1 and B2 are magnetic fields perpendicular to each other represents

A) Horizontal Component of Earth's Magnetic Field

B) Tangent Law

C) Dip or Inclination

D) Declination

56) An athlete runs exactly once around a circular track of length 500 m. The runner's displacement in the race is

A) 50 m

B) 5 m

C) 0.5 m

D) 0 m

57) "Gravitational constant (G)", "Planck's constant (h)" and Velocity of light (c) are

A) Dimensional variables

B) Dimensionless variables

C) Non-dimensional constants

D) Dimensional constants

58) The factor R/N_A in an ideal gas law is

A) Celsius constant

B) Kelvin constant

C) Universal gas constant

D) Boltzmann's constant

docs.aglasem.com

aglasem.com

59) The enthalpy change of a chemical reaction in which 1 mole of a pure substance is formed from the free elements in their most stable states under standard state conditions is called

A) Molar enthalpy of vaporization

B) Standard enthalpy of fusion

C) Standard enthalpy of vaporization

D) Standard Molar Enthalpy of Formation

60) The work done by a given force on a body depends only on

A) The force, the displacement and the angle between them.

B) The force, the velocity and the angle between them.

C) The acceleration, the velocity and the angle between them.

D) The force, the velocity and acceleration between them.

docs.aglasem.com

aglasem.com

Section 2 - Chemistry

61) What will be the nature of existence of an amino acid (containing one amino and one carboxylic acid group) in solution of pH < pKa_1?

A) It exists as anion

B) It exists as cation

C) It exists as zwitterion

D) It exists as neutral species with no charge

62) Dacron is a continuous filament yarn used in curtains, dress fabrics and pressure fire hoses. The reaction for preparing dacron is by the combination of which of the following?

A) Hexamethylene diamine and adipic acid

B) Caprolactum

C) Phenol and formaldehyde

D) Ethylene glycol and terephthalic acid

63) What final product will form when alcoholic KOH is treated with 1,1-dichloro ethane?

A) ethane-1,2-diol

B) ethene

C) ethyne

D) acetaldehyde

64) What will be the relation between the T_1 of gas 1 with M_1=56 and T_2 of gas 2 with M_2=44 if the average speed of gas 1 is equal to most probable speed of gas 2?

A) $T_1 = T_2^2$

B) $T_1 = T_2$

C) $T_1 = (T_2)^{1/2}$

D) $T_1 = 1/T_2$

65) What is the hybridization and geometry of the compound $XeOF_4$?

A) sp^3d^2 and octahedral

B) sp^3d and square pyramidal

C) sp^3d and trigonal bipyramidal

D) sp^3d^2 and square pyramidal

66) Identify the CORRECT increasing order of crystal field stabilization energy value for the given complexes.

A) $[Ir(NH_3)_6]^{3+} < [Rh(NH_3)_6]^{3+} < [Co(NH_3)_6]^{3+}$

B) $[Rh(NH_3)_6]^{3+} < [Co(NH_3)_6]^{3+} < [Ir(NH_3)_6]^{3+}$

C) $[Co(NH_3)_6]^{3+} < [Ir(NH_3)_6]^{3+} < [Rh(NH_3)_6]^{3+}$

D) $[Co(NH_3)_6]^{3+} < [Rh(NH_3)_6]^{3+} < [Ir(NH_3)_6]^{3+}$

67) Of the following, which species is primarily obtained in a solution containing KHF_2?

A) K^+, H^+ and F^-

B) H^+ and KF_2^-

C) KF and H^-

D) K^+ and HF_2^-

68) Identify the optically active cyclohexane from the given options.

A) *trans*-1,3-dimethyl cyclohexane

B) *cis*-1,3-dimethyl cyclohexane

C) *cis*-1,4-dimethyl cyclohexane

D) *trans*-1,4-dimethyl cyclohexane

69) What will be the CORRECT decreasing order of acid strength of the hydroxybenzoic acids?
(Symbols and notations carry their usual meanings)

A) p-hydroxybenzoic acid > benzoic acid > m-hydroxybenzoic acid > o-hydroxybenzoic acid

B) o-hydroxybenzoic acid > m-hydroxybenzoic acid > benzoic acid > p-hydroxybenzoic acid

C) o-hydroxybenzoic acid > benzoic acid > m-hydroxybenzoic acid > p-hydroxybenzoic acid

D) m-hydroxybenzoic acid > benzoic acid > o-hydroxybenzoic acid > p-hydroxybenzoic acid

70) What is the IUPAC nomenclature of isoprene monomers present in natural rubber?

A) 2-methyl-1,3-butadiene

B) 1,3-hexadiene

C) 2,3-dimethyl-1,3-butadiene

D) 2-methyl-1,3-pentadiene

docs.aglasem.com

aglasem.com

71) The number of times the comparative mass of a neutron is heavier than an electron is

A) ~1842

B) ~182

C) ~102

D) ~4050

---

72) Which of the following is a branched polymer, having branched chain polysaccharide units?

A) Starch

B) Bakelite

C) High density polyethylene

D) Nylon

---

73) What product will form when N,N-dimethylaniline reacts with $NaNO_2$ and dilute HCl at low temperature?

A) *p*-nitroso-N,N-dimethylaniline

B) methyl-*n*-hexylamine

C) *m*-benzene diazonium chloride

D) N-nitroso-N-methylaniline

---

74) Which of the following is the CORRECT increasing order of coagulating power of electrolytes required to precipitate a negatively charged As_2S_3 colloid?

A) $NaCl < BaCl_2 < AlCl_3$

B) $BaCl_2 < AlCl_3 < NaCl$

C) $AlCl_3 < NaCl < BaCl_2$

D) $AlCl_3 < BaCl_2 < NaCl$

---

75) Which equation will explain the nature of PV versus P curve for CO_2 gas at moderately low pressure?

A) PV=RT+Pb

B) PV=RT+a/V

C) PV=RT-a/V

D) PV=RT-aV

76) What will be the equilibrium constant of the given reaction carried out in a 5 L vessel and having equilibrium amounts of A_2 and A as 0.5 mole and $2x10^{-6}$ mole respectively? The reaction: $A_2 = 2A$

A) $0.16x10^{-11}$

B) $0.25x10^{5}$

C) $0.4x10^{-5}$

D) $0.2x10^{-11}$

---

77) What condition will facilitate the spontaneity of a reaction if ΔH and ΔS both are negative?

A) low temperature

B) high temperature

C) low pressure

D) high pressure

---

78) What will be the half-cell potential of a hydrogen electrode acting as an anode and dipped in a solution of pH=2?

A) 0 V

B) 0.0196V

C) 0.276V

D) 0.118 V

---

79) How many electrons are involved during the oxidation reaction of $KMnO_4$ in acidic medium?

A) 1

B) 3

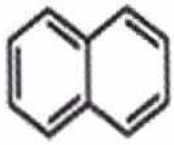
C) 5

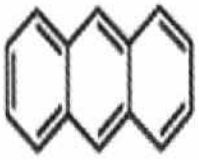
D) 4

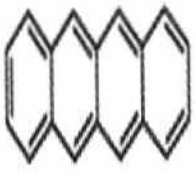
docs.aglasem.com

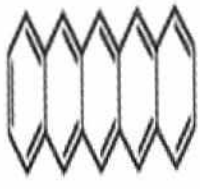
aglasem.com

80) Naphthalene is a white, volatile, solid polycyclic hydrocarbon with a strong mothball odor. Which of the following is the structure of naphthalene?

A) 

B) 

C) 

D) 

---

81) What will be the E_{cell} for the given cell:
$Zn/Zn^{2+}(0.1M)//\ Cu^{2+}(0.01M)/Cu$.
Given: $E^{o}Zn2+/Zn$=-0.76V and $E^{o}Cu2+/Cu$ = 0.34V.
Also predict whether the reaction is spontaneous or non-spontaneous.

A) 1.07V and spontaneous

B) -1.13V and non-spontaneous

C) -1.07V and non-spontaneous

D) 1.13V and spontaneous

---

82) What are the coordination numbers (C.N.) of Ca^{2+} and F^{-} ion in calcium fluoride (CaF_2) crystal structure?

A) C.N. of Ca^{2+} = 4 and F^{-} = 8

B) C.N. of Ca^{2+} = 6 and F^{-} = 6

C) C.N. of Ca^{2+} = 8 and F^{-} = 8

D) C.N. of Ca^{2+} = 8 and F^{-} = 4

83) What will be the geometry of the compound MB_4L_2? Here B is bond pair and L is lone pair.

A) Square planar

B) Octahedral

C) Square pyramid

D) Tetrahedral

---

84) What will be the product when benzaldehyde is treated with NaOD in D_2O?

A) $C_6H_5CH_2OD$ and C_6H_5COONa

B) $C_6H_5CH_2OD$ and C_6H_5COOD

C) C_6H_5CHDOD and C_6H_5COONa

D) $C_6H_5COOCHDC_6H_5$

---

85) What will be the geometry and magnetic moment of the complex $[NiCl_4]^{2-}$?

A) Tetrahedral and 3.87 BM

B) Tetrahedral and 2.82 BM

C) Square planar and 2.82 BM

D) Square planar and 4.89 BM

---

86) Which of the following is the CORRECT reason for HI solution turning brown on exposure to air?

A) HI reacts with H_2O to form I_2

B) HI dissolves NO_2

C) HI reacts with O_2 to form I_2

D) HI reacts with N_2 and O_2 to form NO_2

---

87) In a reaction A + B ⇔ C + D, Le Chatelier's principle asserts that an equilibrium between A and B producing C and D can be shifted towards C and D by
(i) increasing the concentration of A or B
(ii) increasing the concentration of C or D
(iii) decreasing the concentration of A or B

A) (ii) only

B) Both (i) and (ii)

C) (iii) only

D) (i) only

docs.aglasem.com

aglasem.com

88) With respect to atomic spectrum, each line in the Lymer series is due to electrons returning

A) from a particular higher energy level to n = 3

B) from a particular higher energy level to n = 2

C) from a particular higher energy level to n = 1

D) from a particular higher energy level to n = 4

89) The following equation is the Arrhenius Equation. $k = Ae^{-Ea/RT}$, where Ea is the minimum energy molecules must possess in order to react to form a product, k is the rate constant, A is the frequency factor, R is the gas constant and T is the Kelvin temperature. Under normal circumstances, the Arrhenius plot is obtained by plotting

A) logarithm of the inverse of rate constant 1/k, versus the inverse temperature 1/T

B) logarithm of the rate constant k, versus the temperature T

C) logarithm of the rate constant k, versus the inverse temperature 1/T

D) logarithm of the inverse of rate constant 1/k, versus the temperature T

90) What will be the entropy change of the system when expansion of 1 mole of a gas takes place from 3L to 6L under isothermal conditions?
Consider R = 2 cal $K^{-1}mole^{-1}$ and log 2 = 0.301.

A) 2.84 cal K^{-1}

B) 1.386 cal K^{-1}

C) 0.37 cal K^{-1}

D) 5.26 cal K^{-1}

91) What will be the CORRECT stability order of the different conformations of n-butane?

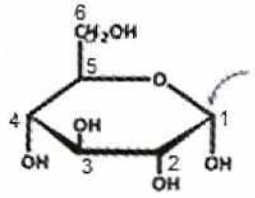
A) fully-eclipsed > eclipsed > gauche > anti-staggered

B) anti-staggered > eclipsed > gauche > fully-eclipsed

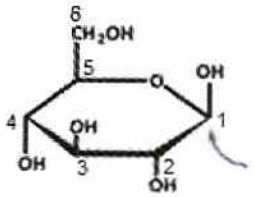
C) anti-staggered > gauche > eclipsed > fully-eclipsed

D) gauche > anti-staggered > eclipsed > fully-eclipsed

92) What is the relationship between the given structures (Look at the arrows)?



α-D-glucopyranose



β-D-glucopyranose

A) Enantiomers

B) Anomers

C) Diastereomers

D) Metamers

93) What will be the CORRECT unit of rate constant k for a reaction whose order is three?

A) $mole^{-1}$ lit sec^{-1}

B) $mole^{2}$ lit sec^{-1}

C) sec^{-1}

D) $mole^{-2}$ $lit^{2}sec^{-1}$

94) Which of following compounds has a highly intense red colour at room temperature?

A) $SnCl_4$

B) SnI_4

C) PbI_2

D) $PbCl_2$

95) A sample of HI(g) is placed in a flask at a pressure of 0.2 atm. At equilibrium, partial pressure of HI(g) is 0.04 atm. What is Kp for the given equilibrium?
$2\,HI(g) \Leftrightarrow H_2(g) + I_2(g)$

A) 0.04

B) 0.4

C) 40

D) 4

docs.aglasem.com

aglasem.com

96) Calculate the molarity of a solution of 30 g of $Co(NO_3)_2$. $6H_2O$ in 4.3 L of solution? Consider atomic mass of Co = 59, N = 14, O = 16, H = 1

A) 0.023 M

B) 0.23 M

C) 0.046 M

D) 0.46 M

97) Which of the following product(s) is/are formed when fructose is treated with Na-Hg in water?

A) Sorbitol and Mannitol

B) Sorbitol and n-Hexane

C) Mannitol and n-Hexane

D) Gluconic acid

98) What will be the heat change at constant volume for the reaction whose heat change at constant pressure is -560 kcal at 27 °C? The reaction is:
$C_8H_{16}+12O_2 \rightarrow 8CO_2+8H_2O$ (Given R = 2 cal mol^{-1} K^{-1})

A) -558200 calories

B) 442800 calories

C) -561800 calories

D) 368240 calories

99) What will be the expression of Kp for the given reaction if the total pressure inside the vessel is P and degree of dissociation of the reactant is a? The reaction: $N_2O_4 = 2NO_2$

A) $4a^2P/(1+a^2)$

B) $4a^2P/(1-a^2)$

C) $a^2P/(1-a^2)$

D) $a^2/(1-a)$

100) What is the CORRECT explanation of the non-reducing property of sucrose?

A) α-D-glucopyranose and β-D-fructofuranose are linked via C_2 and C_1 centres respectively

B) α-D-glucopyranose and β-D-fructofuranose are linked via C_1 and C_2 centres respectively

C) α-D-glucopyranose and β-D-fructofuranose are linked via C_2 and C_2 centres respectively

D) α-D-glucopyranose and β-D-fructofuranose are linked via C_3 and C_4 centres respectively

101) What is the main product formed when iodine reacts with hypo?

A) Na_2SO_4

B) $Na_2S_4O_6$

C) Na_2SO_3

D) Na_2S

102) What will be the resultant products formed when the phosphorus halide PBr_5 splits up?

A) $[PBr_4]^+$ and Br^-

B) $[PBr_6]^-$ and $[PBr_4]^+$

C) $[PBr_4]^+$

D) $[PBr_6]^-$

103) What will be the resultant product when ethyloxybenzene is reacted with HI?

A) phenyl iodide and ethanol

B) ethyl benzene

C) phenol and ethyl iodide

D) *p*-ethyl phenol

104) What will be the enthalpy of formation of NO_2 from the given bond dissociation enthalpy values? The bond dissociation enthalpy values for O_2, NO and NO_2 are as follows: $O_2(g)$: 0 kJ/mol, NO(g): 90.25 kJ/mol and $NO_2(g)$: 33.18 kJ/mol respectively.

A) +114.1 kJ

B) +52.7 kJ

C) -52.7 kJ

D) -114.1 kJ

105) How many geometrical isomers are possible with complexes of the type $[M(ab)_3]$?

A) 2

B) 4

C) 3

D) 5

docs.aglasem.com

aglasem.com

106) Identify the CORRECT basicity order in the nitroanilines? (Symbols and notations carry their usual meanings)

A) o-nitroanilines < p-nitroanilines < m-nitroanilines

B) m-nitroanilines < p-nitroanilines < o-nitroanilines

C) p-nitroanilines < o-nitroanilines < m-nitroanilines

D) o-nitroanilines < m-nitroanilines < p-nitroanilines

107) Identify the anti-aromatic system from among the given options.

A) benzene

B) [14]-annulene

C) [18]-annulene

D) Cyclo-octatetraene

108) Which of the following is the CORRECT configuration of the complex $[RhCl_6]^{3-}$?

A) High spin $t_{2g}^4e_g^2$

B) Low spin $t_{2g}^6e_g^0$

C) Low spin $t_{2g}^3e_g^3$

D) High spin $t_{2g}^5e_g^1$

109) Which electronic configuration will show the HIGHEST first ionization potential?

A) $1s^22s^22p^1$

B) $1s^22s^22p^5$

C) $1s^22s^22p^3$

D) $1s^22s^2$

110) What is the CORRECT increasing order of ionic or atomic radii in the following?

A) $Si^{4+} < P^{5+} < S^{6+} < Cl^{7+}$

B) $P^{5+} < Si^{4+} < Cl^{7+} < S^{6+}$

C) $Cl^{7+} < S^{6+} < P^{5+} < Si^{4+}$

D) $S^{6+} < P^{5+} < Cl^{7+} < Si^{4+}$

111) What will be the first ionization energy of Be atom? Consider the first ionization energy of H atom as 13.6 eV.

A) 27.2 eV

B) 54.4 eV

C) 108.8 eV

D) 4 eV

112) Which of the following statements is/are TRUE for an electrochemical cell?

A) Oxidation occurs at the anode only

B) Reduction occurs at the anode only

C) Oxidation occurs at both the anode and cathode

D) Reduction occurs at both the anode and cathode

113) Which of the following shows the CORRECT reaction for nitrobenzene reduction?

A) Nitrobenzene reacts with Zn dust and NH_4Cl to produce aniline

B) Nitrobenzene reacts with $LiAlH_4$ to produce phenyl hydroxylamine

C) Nitrobenzene reacts with Fe and HCl to produce nitroso benzene

D) Nitrobenzene reacts with Zn dust and NH_4Cl to produce phenyl hydroxylamine

114) What is the hybridization and geometry of the given species? The species are XeF_2 and ICl_2^-.

A) sp^3d and trigonal bipyramidal

B) sp^3d^2 and square planar

C) sp^3d and linear

D) sp^3 and irregular tetrahedron

115) What product is formed when phenol is treated with $CHCl_3$ and NaOH?

A) 3-hydroxybenzaldehyde

B) 2-hydroxy benzoic acid

C) 3-hydroxy benzoic acid

D) 2-hydroxybenzaldehyde

docs.aglasem.com

aglasem.com

116) What is the IUPAC nomenclature of the given compound?



A) 5-ethynyl-1,6-heptadiene
B) 3-ethynyl-1,6-heptadiene
C) 3-vinyl-hept-6-en-1-yne
D) 5-vinyl-hept-1-en-6-yne

117) What is the number of octahedral void(s) per atom present in a cubic close-packed structure?

A) 1
B) 3
C) 2
D) 6

118) What will be the percentage of dimerization of 61 g of benzoic acid in 1000 g of a solvent and producing a depression in freezing point of 2 °C? Consider K_f to be 6.

A) 72%
B) 67%
C) 43%
D) 28%

119) Which of the statements is TRUE regarding chemisorption of a gas on a solid surface?

A) This type of adsorption first increases with increase of temperature
B) No compound formation takes place in this case
C) The forces operating in this are weak Van Der Waal's forces
D) It forms multimolecular layers of gas molecules on the surface

120) Which of the manganese oxides is the most acidic from the given options?

A) Mn_2O_3
B) MnO
C) MnO_2
D) Mn_2O_7

docs.aglasem.com
aglasem.com

Section 3 - Mathematics

121) Nine non zero integers a, b, c, d, e, f, g, h and i are taken such that they form a geometric progression in the same order as mentioned. The common ratio of the geometric progression is an integer. Which of the following relation will always hold?

A) abce > 0

B) bcef > 0

C) ahbd > 0

D) bdgh > 0

122) What will be the equation of the standard hyperbola where foci are (0, ±10) and the length of the latus rectum is 30?

A) $3y^2 - x^2 = 75$

B) $y^2 - x^2 = 25$

C) $3y^2 - x^2 = 25$

D) $y^2 - x^2 = 75$

123) A set P = {7, 21, 28, 42, 14, 0} is given. A relation R holds on elements a and b of set P if either a is a factor of b or b is a factor of a. The relation R on the set P is

A) NOT reflexive

B) NOT symmetric

C) NOT transitive

D) antisymmetric

124) The square of height of a tower is three times the square of its shadow. What would be the angle of depression of sun at this moment?

A) 30°

B) 45°

C) 60°

D) 75°

125) Given that a function $f(x) = [x]^2 + x^2$, where [x] is the greatest integer less than or equal to x. If $f(x) > 25$, then the value of x is

A) any real number

B) a member of the set $\{ x \mid x \geq 0 \}$

C) a member of the set $\{ x \mid x \leq -4 \text{ or } x \geq 4 \}$

D) a member of the set $\{ x \mid x \geq 25 \text{ or } x \leq 0 \}$

126) A 3 X 3 square matrix $M = [a_{ij}]$ is taken, where i = 0, 1, 2 and j = 0, 1, 2. In matrix M, value of each element is determined as $a_{ij} = i \times j$. What will be the value of largest minor of the matrix M?

A) -1

B) 0

C) 1

D) 4

127) What will be the argument of the complex number z = 1 - cosp + isinp?

A) π – p

B) π/4 - p/2

C) π/2 - p/2

D) π - p/2

128) What is the number of different values of the products that can be done using two or more of the numbers 3, 4, 5 and 7? (A number can be used at most once)

A) 11

B) 12

C) 15

D) 24

129) From a deck of cards, all the diamonds are removed. From remaining cards, a card is chosen randomly. What is the probability that it will be a black card?

A) ½

B) 2/3

C) 1/3

D) ¾

130) A parabola $y^2 = 32x$ is drawn. From its focus, a line of slope 1 is drawn. The equation of the line is

A) y=x+8

B) y=x-4

C) y=x

D) y=x-8

docs.aglasem.com

aglasem.com

131) What will be the argument of the complex number $z = \frac{i-1}{e^{\frac{i\pi}{3}}}$?

A) π/4
B) π/3
C) 5π/12
D) 3π/8

---

132) An equilateral triangle is inscribed in the parabola $y^2 = 4ax$, where one vertex of the triangle is at the vertex of the parabola. The length of the side of the triangle is

A) 8a
B) 16a
C) $8a\sqrt{3}$
D) $16a\sqrt{3}$

---

133) On a biased dice, numbers from 1 to 6 are written on its six faces. The probability that a face will appear on throwing the dice is directly proportional to number written on that face. What is the probability that a face on which a multiple of 3 is written will appear both times when this dice is thrown twice?

A) 5/28
B) 3/14
C) 2/7
D) 9/49

---

134) The direction ratios of a normal to a plane are (3, 12, 4). Through which of the following points the plane passes if origin is at a distance of 2 units from this plane?

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

---

135) The sum of the series:

$\sin p + x\sin(p+q) + \frac{x^2}{2!}\sin(p+2q) + \cdots\infty$ is

A) 0
B) $e^{x\cos q}[\sin(p + x\sin q)]$
C) 1
D) $e^{x\cos q}[\cos(p + x\sin q)]$

---

136) The first order derivative of f(x) is given by $f'(x) = \sec^4 x + 5$ with f(0) = 0. Then f(x) =

A) $\tan x + \frac{1}{3}\tan^3 x + 5x + 2$
B) $\tan x + \frac{1}{3}\tan^3 x + 5x$
C) $\tan x + \frac{1}{3}\tan^3 x$
D) $\frac{1}{3}\tan^3 x + 5x$

---

137) A function $f(x) = x^2\tan x + e^{2x}$ is given. The value of second order derivative of f(x) at x = 0 is

A) 1
B) 2
C) 4
D) 0

---

138) What will be the area of the triangle formed by the lines joining the vertex of the parabola $y^2 = 28x$ to the ends of its latus rectum?

A) 64 sq. units
B) 51 sq. units
C) 98 sq. units
D) 72 sq. units

docs.aglasem.com
aglasem.com

139) A plane is given as 3x+4y-12z+13 = 0. The points (1, 1, k) and (-3, 0, 1) are equidistant from the plane. What will be the quadratic equation that will have roots as values of k?

A) $4x^2 - 15x + 9 = 0$

B) $x^2 - 10x + 25 = 0$

C) $3x^2 - 8x + 4 = 0$

D) $3x^2 - 10x + 7 = 0$

---

140) There is a set P of ordered pairs in which each pair has a vowel as first element and a consonant as second element. It is given that $M = 4^{10}$. How many elements will be there in power set of P?

A) $32(M^5)$

B) $16(M^5)$

C) $32(M^4)$

D) $16(M^4)$

---

141) $[(\cos 3t + i\sin 3t)^4(\cos 4t - i\sin 4t)^5(\cos 5t + i\sin 5t)^4] \div (\cos 4t + i\sin 4t)^3 =$

A) 0

B) 1/2

C) 1

D) $8\sqrt{2}$

---

142) An eagle is sitting at a distance of 100 metres from base of a building. It can see a sparrow sitting at the top of the building at an angle of elevation of 30 degrees. It moves towards the building and sits at a point such that now it can see the same sparrow at an angle of elevation of 45 degrees. At what distance from the base of building is the eagle sitting now?

A) 57.735 metres

B) 70.711 metres

C) 100 metres

D) 173.205 metres

---

143) $\int_0^{\frac{\pi}{4}} \tan^2 x \sec^4 x \, dx =$

A) 1/3

B) 4/15

C) 1

D) 8/15

---

144) 4 consecutive years are taken such that exactly one of them is a leap year. One of these four years is randomly chosen. What is the probability that it will have 53 Wednesdays?

A) 1/7

B) 3/14

C) ¼

D) 5/28

---

145) A system of linear equations in two variables, p and q, is given as $(n + 1)p + (n + 2)q = 8$, $p - (n + 1)q + (n + 2) = 0$, $p + q = 3$. Which of the following would be one of the values of n for which the given system of linear equations is consistent?

A) 0

B) 1

C) 3

D) 7

---

146) It is given that $f(x) = \frac{-3x + (-1)^x}{4x - (-1)^x}$. The limit value of the function f(x) as x tends to infinity is

A) 3/4

B) -3/4

C) 1/4

D) -1/4

---

147) For 'C' is an arbitrary constant, the solution of the differential equation $3(xy)^2dx + 2x^3ydy = 0$ is given by

A) $x^2y^2 + C = 0$

B) $x^3y^3 + C = 0$

C) $x^3y^2 + C = 0$

D) $x^2y^3 + C = 0$

docs.aglasem.com

aglasem.com

148) For which of the following values of T, the expression (1 + icos T)/(1 - 2icos T) will give a real number?

A) 0

B) π/2

C) π/3

D) 3π/4

149) The solution of $\frac{dy}{dx} = (y + 4x + 1)^2$ when y(0) = 1, is given by

A) y = 2tan(2x + π/4) – 4x – 1

B) y = 2cot(2x + π/8) – 4x – 1

C) y = 2tan(x + π/4) – 4x – 1

D) y = 2cot(2x + π/4) – 4x – 1

150) In which of the following domains f(x) is continuous, where f(x) $= \frac{|x+2|}{\tan^{-1}(x+2)}$?

(Note: R denotes set of real numbers)

A) R

B) R - {-2, 2}

C) R - {-2}

D) {-2, 2}

151) The sum value of the infinite series $1 + \frac{1}{5} + \frac{1}{25} + \frac{1}{125} + \frac{1}{625} + \cdots \infty$ is

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

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

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

D) indefinite

152) Out of 4 symbols, 5 letters and 3 numbers, how many strings can be formed each containing 3 letters, 2 symbols and beginning with a number?

A) 180

B) 2160

C) 14400

D) 21600

153) If [x] represents greatest integer less than or equal to x, then $\int_2^5 2[x]\,dx$ =

A) 9

B) 12

C) 18

D) 24

154) Which of the following can be the equal expression for cos(3T) + isin(3T) using the De Moivre's theorem and binomial theorem concepts?

A) $\cos^3T + 3i\cos^2T \sin T - 3\cos T \sin^2T + i\sin^3T$

B) $\cos^3T + 3i\cos^2T \sin T + 3\cos T \sin^2T - i\sin^3T$

C) $\cos^3T + 3i\cos^2T \sin T - 3\cos T \sin^2T - i\sin^3T$

D) $\cos^3T + 3i\cos^2T \sin T + 3\cos T \sin^2T + i\sin^3T$

155) For 'C' is an arbitrary constant,

$\int \frac{2x-1}{(x-1)(x+2)(x-3)}\,dx$ =

A) 3x - 2 + C

B) $\frac{1}{6}\log(x-1) - \frac{1}{3}\log(x+2) + \frac{1}{2}\log(x-3) + C$

C) $-\frac{1}{6}\log(x-1) - \frac{1}{3}\log(x+2) + \frac{1}{2}\log(x-3) + C$

D) $\frac{1}{6}\log(x-1) + \frac{1}{3}\log(x+2) + \frac{1}{2}\log(x-3) + C$

docs.aglasem.com

aglasem.com

156) Two lines in three-dimensional system are given as (x-1)/2 = (y-2)/3 = (z-3)/4 and (x-4)/5 = (y-1)/2 = z. Their point of intersection is

A) (1,1,1)

B) (1,2,3)

C) (-1,-1,-1)

D) (4,1,0)

---

157) How many digits will be there after decimal point 12th term of the sequence: 32, 16, 8, 4, ...?

A) 5

B) 6

C) 7

D) 8

---

158) The domain of the function $f(x) = \log(3x^2 - 4x + 7)$ is

A) set of real numbers - {3, 2, 7}

B) set of real numbers

C) set of positive real numbers

D) set of non negative real numbers

---

159) For 'C' is an arbitrary constant, the solution of the differential equation $\frac{dy}{dx} + 2 = e^{2x+y}$ is given by

A) $(x+C)e^{(x+2y)} + 1 = 0$

B) $(2x+C)e^{(2x+y)} + 1 = 0$

C) $(x+C)e^{(2x+y)} + 1 = 0$

D) $(2x+ y + C)e^{(2x+y)} + 1 = 0$

---

160) What will be the sum of coefficients of even powers of x in the expansion of $(1 + 3x)^{10}$?

A) 524144

B) 524414

C) 524800

D) 524288

161) A function is given by the equations in parametric form as x = 2cost - cos(2t), y = 2sint - sin(2t). The value of $\frac{dy}{dx}$ at t = 90° is

A) 0

B) -1

C) 1

D) 2

---

162) To the curve x = sin t + 2t, y = 4t, a normal is drawn at t = 0. Where would this normal intersect with line y = x + 3?

A) (6, 9)

B) (9,12)

C) (0, 3)

D) (4, 7)

---

163) Suppose A, B and C are three sets, each with three elements. The number of subsets of the set A x B x C that have at least 2 elements is

A) $(2^{27}) - 28$

B) $(2^{27}) - 55$

C) 27

D) $(27^2) - 3$

---

164) Which of the following functions is neither even nor odd?

A) $f(x) = 5x + \sin(4x)$

B) $f(x) = 4x^3 + 7\tan x$

C) $f(x) = 7x^4 + 8x^2 - 6x$

D) $f(x) = 5x^2 + \cos(6x)$

---

165) Two matrices, A and B, are both 5 X 5 square matrices such that A = kB, where k is a non zero constant. If |B| = z, then what will be the value of |4(A + B)|?

A) 5z

B) (20k + 20)z

C) 3125z

D) $(4k + 4)^5z$

docs.aglasem.com

aglasem.com

166) The mean of a group of data is given as 27. Data is 39, 21, 18, X, Y, 24. What could be the values of X and Y, if both X and Y are prime?

A) X = 23, Y = 29

B) X = 29, Y = 31

C) X = 26, Y = 34

D) X = 12, Y = 48

---

167) A set P is taken such that P = {2/3^p | p is a natural number}. What will be the sum of elements of set P?

A) 1

B) 2/3

C) 5/3

D) 2

---

168) M = [m_{ij}], is a 4 X 4 square matrix, where i = 1, 2, 3, 4 and j = 1, 2, 3, 4. In M, m_{ij} = sin (i.j)x. What will be the value of the determinant |M| at x = $\pi/3$?

A) 0

B) 1

C) -1

D) 1/2

---

169) The probability that Madhu will pass in her terminal exam is 1/3. The probability that Meena will fail in same exam is 3/4. What is the probability that exactly one of them passes in this exam?

A) 5/12

B) 1/4

C) 1/6

D) 11/24

---

170) What will be the area enclosed by the ellipse given by $\frac{4x^2}{81} + \frac{9y^2}{49} = 1$?

A) 16.49 sq. units

B) 24.72 sq. units

C) 32.97 sq. units

D) 48 sq. units

---

171) We are given that p and q are two complex numbers such that |p+q| = |p| + |q|. The value of arg(p) - arg(q) is

A) 0

B) $\pi/2$

C) $\pi/3$

D) $3\pi/4$

---

172) If $-\pi/2 < p < \pi/2$, then the values of 'p' for which $2\sin^2 p - 7\sin p + 3 > 0$, lie in

A) $(0, \pi/2)$

B) $(-\pi/2, -\pi/6)$

C) $[-\pi/2, \pi/6)$

D) $(-\pi/2, 0)$

---

173) Two fair coins are thrown together. Only if heads appear on both coins, a fair dice is thrown on which natural numbers from 1 to 6 are written on the faces. What is the probability that face on which 2 is written will appear on the dice?

A) 1/4

B) 1/6

C) 1/12

D) 1/24

---

174) It is given that $z_r = \cos(\pi/2^r) + i\sin(\pi/2^r)$. The value of the product $z_1.z_2.z_3.z_4.....\infty$ is

A) 0

B) 1

C) -1

D) 1 + i

---

175) If $f(x) = \sqrt{[(\sin 2x + 2)(\cos 2x + 2)]}$ for x is a real number, then which of the following values lies in the domain of f(x) but NOT in the range of f(x)?

A) $\sqrt{6}$

B) $\sqrt{2}$

C) 1

D) $(1/\sqrt{2}) + 2$

docs.aglasem.com

aglasem.com

176) A set T is given as T = {x∈ R | (x - 3) = (x + 4)², x < 2}. Which of these would be TRUE about the set T?

A) T is an empty set

B) T is a singleton set

C) x = 3 is a member of T

D) x = -4 is a member of T

---

177) If $S = \sin^2 p - \frac{1}{2}\sin(2p)(\sin^2 p) + \frac{1}{3}\sin(3p)(\sin^3 p) - \frac{1}{4}\sin(4p)((\sin^4 p) + \cdots \infty$

then tan S =

A) $\frac{\cos^2 p}{1 + \cos p . \sin p}$

B) $\frac{\sin^2 p}{1 + \cos p . \sin p}$

C) $\frac{\sin^2 p}{1 + \cos 2p}$

D) 0

---

178) A plane passes through the points (2, 1, -1) and (-1, 3, 4). Also, this plane is perpendicular to the plane x - 2y + 4z = 10. The equation of the plane is

A) 7x + 9y + 6z = 23

B) x + y + z = 2

C) 7x + y + z = 0

D) 18x + 17y + 4z = 49

---

179) What will be the distance of point (2, 4, -1) from the straight line given by (x+5) = (y+3)/4 = (6-z)/9?

A) 5 units

B) 6 units

C) 7 units

D) 9 units

---

180) What will be the coordinates of foot of perpendicular from the point (1, 1.5, 2) to the plane 2x - 2y + 4z + 5 = 0?

A) (1, 1/2, 1)

B) (0, 5/2, 0)

C) (0, 0, -5/4)

D) (6, 1, -15/4)

docs.aglasem.com

aglasem.com