Group C (Maths), Model Answers, CET-2018

Section I- English Language and Comprehension

Direction: Choose the correct preposition to fill each blank

1. What is the time ---------- your watch?

   A. by X
   B. on
   C. at
   D. over
   E. No option is correct

2. My friend lives ---------- the street.

   A. over
   B. under
   C. at
   D. across X
   E. No option is correct

Direction: Fill in the blanks:

3. If he had told the truth, I ---------- have pardoned him.

   A. would X
   B. should
   C. ought to
   D. shall
   E. No option is correct

4. Some hermits live an ------- life.

   A. busy
   B. wandering
   C. isolated X
   D. domestic
   E. No option is correct

Direction: Choose the most appropriate word to fill in the blank:

5. She was ---------- with her friends.

A. sat
B. sit
C. stand
D. sitting X
E. No option is correct

Direction: Identity the Tense in the sentences given below:

6. She has worked out all the sums.

A. Present simple
B. Present continuous
C. Present perfect X
D. Present perfect continuous
E. No option is correct

7. He drinks tea every morning.

A. Present simple X
B. Present continuous
C. Present perfect
D. Present perfect continuous
E. No option is correct

Direction: Fill in the blank with Determiners:

8. ----------roses in your garden are beautiful.

A. An
B. A
C. This
D. The X
E. No option is correct

9. -------gentleman came to meet you.

A. These
B. Those
C. A X
D. Any
E. No option is correct

Direction: Fill in the blank with Phrasal verbs:

10. The enemy --------arms.

A. lay up
B. let in
C. lay off
D. laid down X
E. No option is correct

11. Rising prices will force people to ---------- expenditure.

A. cut down X
B. cut up
C. cut off
D. cut out
E. No option is correct

Direction: Pick the word with the right spelling:

12.
A. Beginning X
B. Begenning
C. Bigening
D. Beganing
E. No option is correct

13.
A. Calebration
B. Celebration X
C. Callibration
D. Cellibration
E. No option is correct

Direction: Choose the option which is closest in meaning to the word on the top:

14. Isolated

A. Mixed
B. Very late
C. Separated X
D. In a queue
E. No option is correct

Direction: Pick the word opposite in meaning to the word on the top:

15. Virtue

A. Vice X
B. Wise
C. Good
D. Bad
E. No option is correct

Section II- Physics

16. Which of the following colors is scattered minimum?

A. Violet
B. Red X
C. Blue
D. Orange
E. No option is correct

17. For a particle expecting simple harmonic motion, the acceleration is proportional to

A. Zero
B. Distance from mean position
C. Distance travelled since t = 0
D. Displacement from mean position X
E. No option is correct

18. Which of the following pairs represent units of same physical quantity?

A. Kelvin & Joule
B. Joule & Calorie X
C. Newton & Calorie
D. Kelvin & Calorie
E. No option is correct

19. The number of valance electrons in Silicon atom is

A. 4 X
B. 2
C. 3
D. 6
E. 1

20. The upper half on inclined plane with inclination θ is perfectly smooth, while the lower half is rough. A body starting from rest at the top will again come to rest at the bottom, if the coefficient of friction for lower half is

A. 2 tan θ X
B. tan θ
C. 2 sin θ
D. 2 cos θ
E. No option is correct

21. A bullet fired into a fixed target loses half of its velocity after penetrating 3 cm. How much further will it penetrate before coming to rest, assuming that it faces constant resistance to motion?

A. 3.0 cm
B. 2.0 cm
C. 1.5 cm
D. 1.0 cm X
E. 7.3 cm

22. A bomb of mass 16 kg at rest explodes into two pieces of mass 4 kg and 12 kg. The velocity of the 12 kg mass is $4ms^{-1}$. The kinetic energy of the other mass is

A. 192 J
B. 96 J
C. 285 J
D. 190 J
E. 288 J X

23. A man uses a pully system to raise 150 kg load to a height of 10 m. It he exerts a force on the rope of 50 N through a distance of 35 m to accomplish the work in 7 seconds, the average power used and efficiency of the machine are

A. 214 W, 86%
B. 250 W, 86% X
C. 250 W, 81%
D. 230W, 83%
E. 214w, 86%

24. If the mass-energy equivalence is taken into account, when water is cooled to form ice, the mass of water should.

A. increase X
B. remain unchanged
C. decrease
D. first increase then decrease
E. No option is correct

25. A solid sphere is rotating in free space. If the radius of the sphere is increased keeping the mass same, which one of the following will not be affected?

A. moment of Inertia
B. angular Velocity
C. angular momentum X
D. rotational kinetic energy
E. No option is correct

26. If S is stress and Y is Young's modulus of the materials of a wise, the energy stored in the wise per unit volume is

A. $2S^2Y$
B. $2Y/S^2$
C. $S^2/2Y$ X
D. $S/2Y$
E. No option is correct

27. The minimum volume of block of wood (density 800 kg m^{-3}) if it is to hold a 60 kg man entirely above the water when he stands on it, is

A. 0.10 m^3
B. 0.25 m^3
C. 0.20 m^3
D. 0.15 m^3 X
E. No option is correct

28. The thermal capacity of 40 g of aluminium is (specific heat = 0.2 $calg^{-1}C^{-1}$)

A. 40 cal $^oC^{-1}$
B. 160 cal $^oC^{-1}$
C. 8 cal $^oC^{-1}$ X
D. 200 cal $^oC^{-1}$
E. No option is correct

29. Whenever a body is in motion with variable velocity, in general the direction of motion is:

A. The direction of acceleration
B. The direction of velocity X
C. Perpendicular to direction of acceleration
D. Perpendicular to direction of velocity
E. No option is correct

30. The earth radiates in the infrared region of the spectrum. The spectrum is correctly given by

A. Wien's law X
B. Stefan's law of radiation
C. Rayleigh Jeans law
D. Plank's law of radiation
E. No option is correct

31. The total energy of a particle executing simple harmonic motion is

A. α x
B. α x^2
C. independent of x X
D. α $x^{1/2}$
E. No option is correct

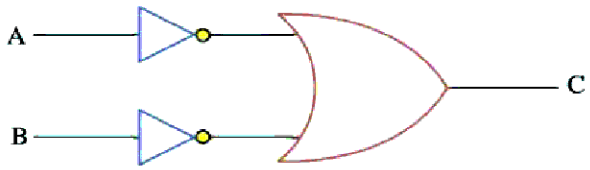
32. A wave y = a sin (wt – kx) on a string meets with another wave producing a node at x = 0. Then, the equation of the unknown wave is

A. y = a sin (wt + kx)
B. y = - a sin (wt + kx) X
C. y = a sin (wt – kx)
D. y = - a sin (wt – kx)
E. No option is correct

33. The value of charge q at the center of two equal and like charges Q so that the three charges are in equilibrium is

A. $\frac{-Q}{4}$ X
B. $\frac{+Q}{4}$
C. Q
D. 2Q
E. No option is correct

34. The logic circuit shown in figure represents characteristics of which logic gate?



A. OR gate
B. AND gate
C. NOR gate
D. NAND gate X
E. NOT gate

35. The band gap of conductor, semiconductor and insulator are respectively E_{g1}, E_{g2} and E_{g3}, The relationship between them can be given as.

A. $E_{g1} = E_{g2} = E_{g3}$

B. $E_{g1} > E_{g2} > E_{g3}$

C. $E_{g1} < E_{g2} < E_{g3}$ X

D. $E_{g1} < E_{g2} > E_{g3}$

E. No option is correct

Section III- Chemistry

36. The hybridization of methane, ethene and ethyne are _____respectively.

A. sp^3, sp^2 and sp X
B. sp^3, sp and sp^2
C. sp^3, sp and sp
D. sp^2, sp and sp^2
E. sp, sp^2 and sp

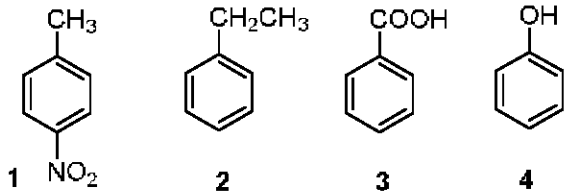
37. Which of the following intermediates is involved in S_N1 reaction mechanism?

A. Carbanion
B. Carbocation X
C. free radical
D. pentavalent transition state
E. Carbine

38. Cresols are _____

A. Dihydric phenols
B. Trihydric phenols
C. Trihydric alcohols
D. Aliphatic compounds
E. hydroxy toluenes X

39. Which of the following substrates will undergo Friedel-Crafts alkylation reaction easily?



1 2 3 4

A. 1 and 2
B. 1 and 3
C. 1 and 4
D. 2 and 3
E. 2 and 4 X

40. Natural rubber is a polymer of _____.

A. Neoprene
B. Isoprene X
C. Chloroprene
D. Butadiene
E. Vinyl acetate

41. Dimethyl ether and ethyl alcohol are _____.

A. Metamers
B. Valance bond isomers
C. Functional isomer X
D. Position Isomer
E. Tautomer

42. Which of the following alkanes can be prepared by hydrogenation reaction of only two alkenes?

A. 2,2-Dimethyl butane
B. 2,3-Dimethyl butane X
C. 2-Methyl pentane
D. n-Hexane
E. 3-Methyl pentane

43. Cannizaro reaction is not shown by_____.

A. HCHO
B. C_6H_5CHO
C. CH_3CHO
D. CH_3CH_2CHO
E. Both CH_3CHO and CH_3CH_2CHO X

44. Compound [**A**] $C_5H_{10}O$ forms phenyl hydrazone derivative. Tollen's test and iodoform test are negative for this compound. It gives n-pentane on $LiAlH_4$ reduction. The compound [A] is____.

A. Pentanal
B. Pentan-2-one
C. Pentan-3-one X
D. Amyl alcohol
E. Neo-pentyl alcohol

45. One mole of an ideal gas is allowed to expand freely and adiabatically in to vacuum until its volume has doubled. The expression which is ***not*** true about the given statement is _____.

A. $\Delta H=0$
B. $\Delta S=0$ X
C. $\Delta U=0$
D. $W=0$
E. No option is correct

46. The statement " The mass of a gas dissolved in a given mass of a solvent at any temperature is proportional to the pressure of the gas above the solvent" is

A. Dalton's law of partial pressure
B. Law of mass action
C. Henry's Law X
D. Hess's Law
E. No option is correct

47. In a solid lattice the cation has left a lattice site and is located at an interstitial position, the lattice defect is known as _____.

A. interstitial defect
B. valency defect
C. frenkel defect X
D. schottky defect
E. worner defect

48. If P, V, M, T and R are pressure, volume, molar mass, temperature and gas constant respectively, then for an ideal gas the density is given by _____

A. RT/PM
B. P/RT
C. M/V
D. PM/RT X
E. V/M

49. The best conductor of electricity is 1.0 M solution of _____ .

A. sulfuric acid X
B. boric acid
C. acetic acid
D. phosphoric acid
E. both sulfuric acid & acetic acid

50. Joule-Thomson expansion is _____ .

A. isobaric
B. Isoenthalpic X
C. Isothermal
D. both isobaric & isothermal
E. No option is correct

51. Which of the following phosphorous oxyacids is a stronger reducing agent?

A. Hypophosphorous acid X
B. phosphorous acid
C. Hypophosphoric acid
D. phosphoric acid
E. Pyrophosphorous acid

52. Example of intrinsic colloid is _____

A. Glue X
B. Sulphur
C. Fe
D. As_2S_3
E. Mg

53. The metallurgical process in which metal is obtained in a fused state is called_____.

A. Smelting X
B. Roasting
C. Calcination
D. Froth flotation
E. Electrodialysis

54. Potash alum is_____.

A. Complex salt
B. Acid salt
C. Double salt X
D. Normal salt
E. No option is correct

55. Which one of the following metal sulphides is yellow?

A. Zinc sulphide
B. Cadmium sulphide X
C. Nickel sulphide
D. Lead sulphide
E. Magnesium sulphide

Section IV- Mathematics

56. Let $A = \{a, b, c\}$. Then number of equivalence classes on A is:
A. 1
B. 2
C. 3
D. 5 X
E. 6

57. The number of all possible invertible matrices of order 2 X 2 with entry 0 or 1 is:
A. 1
B. 4
C. 6 X
D. 10
E. 16

58. $\begin{vmatrix} x & 1 & x+1 \\ y & 2 & y+2 \\ z & 3 & z+3 \end{vmatrix} =$

A. $x + 4y + 9z$
B. $x - 2y + 3z$
C. $2xy + 3xz + 6yz$
D. $2xy - 3yz + yz$
E. 0 X

59. $2 + 2^2 + \ldots + 2^{100} =$

A. $2^{101} - 1$
B. $2^{101} - 2$ X
C. $2^{101} - 100000000$
D. $2^{100} - 2$
E. $2^{99} - 2$

60. How many 2 digit odd numbers can be formed from the digits 1, 2, 3, 4, 5, 6, 7, 8, 9 if the digits can not be repeated ?

A. 45
B. 40 X
C. 25
D. 20
E. 18

61. If $\sin x = 3/5$, $\cos y = -12/13$, where x and y both lie in second quadrant, then $\sin(x + y) = ?$

A. -46/65
B. -36/65
C. -20/65
D. -28/65
E. -56/65 X

62. Let $f(x) = |x - 1| + |x - 2|$. Then

A. f is differentiable on R
B. f is continuous on R X
C. f is not continuous at 1, but continuous at 2
D. f is not continuous at 2, but continuous at 1
E. f is not continuous at 1 and 2

63. If $y = 7 \sin x + 3\cos x$, then the value of d^2y/dx^2 is:

A. y
B. $-y$ X
C. 0
D. $7 \cos x - 3 \sin x$
E. $7 \cos x + 3 \sin x$

64. In which of the following intervals the function $f(x) = x^2 - 3x + 4$ is increasing ?

A. $(0, \infty)$
B. $(1, \infty)$
C. $(3/2, \infty)$ X
D. $(-\infty, 1)$
E. $(-\infty, 3/2)$

65. The two positive numbers whose sum is 15 and the sum of whose squares is minimum are:

A. 5, 10
B. 6, 9
C. 7, 8
D. 15/2, 15/2 X
E. 13/2, 17/2

66. The maximum radius of a circle whose center is (2, 3) and which lies in the 1st quadrant is:

A. 1
B. 2 X
C. 3
D. 4
E. 5

67. The equation of the parabola with focus (2, 0) and directrix $x = -2$ is:

A. $y^2 = 2x$
B. $y^2 = 4x$
C. $y^2 = -2x$
D. $y^2 = -4x$
E. $y^2 = 8x$ X

68. If α and β are roots of $x^2 + ax + b = 0$; then $(\alpha - \beta)^2$ is equal to:

A. $a^2 - b$
B. $a^2 + b$
C. $a^2 - 2b$
D. $a^2 + 2b$
E. $a^2 - 4b$ X

69. How many 3-digit even number can be formed from the digits 0; 1; 2; 3; 4; 5; 6 if the digits can be repeated?

A. 196
B. 168 X
C. 147
D. 126
E. 24

70. The differential equation representing the family of parabolas having vertex at origin and axis along positive direction of x-axis is:

A. $y^2 - 2xy\frac{dy}{dx} = 0$ X
B. $y^2 + 2xy\frac{dy}{dx} = 0$
C. $-y^2 - 2xy\frac{dy}{dx} = 1$
D. $-y^2 + 2xy\frac{dy}{dx} = 1$
E. No option is correct

71. If $\vec{a}$ and $\vec{b}$ are such that $|\vec{a}| = 3$, $|\vec{b}| = 4$ and $\vec{a} . \vec{b} = 4$, then $|\vec{a} - \vec{b}| =$

A. 1
B. $\sqrt{11}$
C. $\sqrt{5}$
D. $\sqrt{21}$
E. $\sqrt{17}$ X

72. The equation of the plane that contains the point (1,-1, 3) and is perpendicular to each of the planes $2x + 3y - 2z = 5$ and $x + 2y - 3z = 8$ is :

A. $-5x + 4y + z = 6$
B. $-5x + 4y + z = -6$ X
C. $x - y + 3z = 11$
D. $2x + y + 6z = 19$
E. $2x + 3y - 3z = -10$

73. Nine cards numbered 1 to 9 are placed in a box, mixed up thoroughly and then one card is drawn randomly. If it is known that the number on the drawn card is more than 4, then the probability that it is an even number is:

A. 2/7
B. 3/5
C. 2/5 X
D. 1/2
E. 3/4

74. In a class of 50 students, 25 students play hockey, 20 students play tennis and 15 students play both the games. Then the number of students who play neither is:

A. 35
B. 25
C. 20 X
D. 15
E. No option is correct

75. The probability distribution of x is:

x	1	2	3	4
p(x)	0.3	2k	k	4k

Then the value of k is:

A. 0.1 X
B. 0.2
C. 0.3
D. 0.05
E. 0.15