GLOBAL EDUCATION CENTRE
Doha | Al Wakra | Al Khor

GRADE 12 JEE

Important Instructions:-

1. Immediately fill in the particulars on this page of the Test with Black/Blue Ball Point .
2. The test is of **70** minutes duration.
3. The Test consists of **75** questions.
4. The maximum marks are **240**.
5. There are three parts in the question paper I, II, III consisting of Quick Answer Types ,Logical and Analytical Reasoning and Aptitude respectively
6. **PART I** carries question of **2** marks.
7. **PART II** carries question of **4** marks.
8. **PART III** carries question of **4** marks.
9. Quick Answer Type questions will be applicable for 10 minutes.

10. Candidates will be awarded marks as stated above in instruction No. 6, 7, and 8 for correct response of each question.
11. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.
12. There is only one correct response for each question. Filling up more than one response in any question will be treated as wrong response
13. For writing particulars/marking responses on Side-1 and Side–2 of the Answer Sheet use only Black Ball Point Pen provided in the examination hall.
14. No candidate is allowed to carry any textual material, printed or written, bits of papers, pager, mobile phone, any electronic device, etc. except the Admit Card inside the examination room/ hall.
15. Rough work is to be done on the space provided for this purpose in the Test Booklet only. This space is given at the bottom of each page.
16. On completion of the test, the candidate must hand over the Answer Sheet to the Invigilator on duty in the Room/Hall.
17. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer Sheet.
18. Do not fold or make any stray mark on the Answer Sheet.
19. **25% negative marking for incorrect questions**.

Name of the Candidate (in Capital letters) :_____

Roll Number : in figures_____ _____

: in words_____

Name of Examination Centre (in Capital letters) :_____

Candidate's Signature

1. Invigilator's Signature :_____
2. Invigilator's Signature :_____

PART I
QUICK ANSWER TYPES

1. Transpose of a rectangular matrix is a
(A) rectangular matrix
(B) diagonal matrix
(C) square matrix
(D) scaler matrix

2. If |A| = 0, then A is
(A) zero matrix
(B) singular matrix
(C) non-singular matrix
(D) 0

3. If A is a symmetric matrix, then A^T =
(A) A
(B) |A|
(C) 0
(D) diagonal matrix

4. In Redox reactions, electrons may be
(A) gained
(B) lost
(C) shared
(C) both A and B

5. During electrolysis, mass of a substance produced is proportional to
(A) time of constant current
(B) strength of current
(C) voltage provided
(D) both A and B

6. Area under current-time graph represents
(A) magnitude of charge
(B) dielectric
(C) amount of positive charge
(D) amount of negative charge

7. Work done in charging a capacitor is given by
(A) (1⁄2)QV
(B) 2QV
(C) QV
(D) 2V

8. Capacitor is fully charged if potential difference is equal to?
(A) e.m.f
(B) current
(C) resistance
(D) power

9. Silicon (IV) oxide which is found in mineral quartz is very similar to
(A) graphite
(B) diamond
(C) iron
(D) copper

10. Metal which can be melted even by warmth of human palm is?
(A) gallium
(B) indium
(C) aluminum
(D) tungsten

11. State of freezing involves
(A) loss of kinetic energy
(B) increased force of attraction
(C) liquid solidifies
(D) All of Above

12. Relative molecular mass of a substance can be found by using
(A) relative spectrometer
(B) mass spectrometer
(C) weight spectrometer
(D) radius spectrometer

13. Strength and high melting point of ceramics is due to their
(A) density
(B) malleability
(C) giant molecular structure
(D) ductility

14. Graphite have high melting and boiling points but they are
(A) soft
(B) do not conduct heat
(C) do not conduct electricity
(D) All of Above

15. Magnetic field can be produced by using
(A) permanent magnet
(B) electric current
(C) temporary magnet
(D) All the above

16. If magnetic flux density and current are at right angles, then component of force acting on conductor is?
(A) BIL cosθ
(B) BIL sinθ
(C) BIL tanθ
(D) BL sinθ

17. F = BIL can only be used if magnetic field and electric current are
(A) at right angles to each other
(B) in same direction
(C) anti-parallel to each other
(D) anti-perpendicular to each other

18. Strength of magnetic field of solenoid can be increased by adding core made of
(A) Copper
(B) Ferrous
(C) Silver
(D) Aluminum

19. The rate of reaction of spontaneous reaction is generally very slow. This is due to the fact that
(A) The equilibrium constant of the reaction is < 1
(B) The activation energy of the reaction is large
(C) The reaction is exothermic
(D) The reaction is endothermic

20. Effect of concentration of reagent on rate of reaction determines
(A) order of reaction
(B) concentration of products
(C) concentration of reactants
(D) energy of activation

21. Changes in electrical conductivity during reactions is due to
(A) ions production
(B) free electrons
(C) free protons
(D) both A and B

22. E.M.F can be induced in a circuit by
(A) changing magnetic flux density
(B) changing area of circuit
(C) changing the angle
(D) all of above

23. Currents that flow in circles inside a disc are known as
(A) eddy currents
(B) circular currents
(C) air currents
(D) alternating current

24. The probability of a leap year selected at random contain 53 Sunday is:
(A) 53/ 366
(B) 1/7
(C) 2/7
(D) 53/365

25. A bag contains 3 red and 2 blue marbles. A marble is drawn at random. The probability of drawing a black ball is :

(A) 3/5
(B) 2/5
(C) 0/5
(D) 1/5

26. The probability that it will rain tomorrow is 0.85. What is the probability that it will not rain tomorrow is?

(A) 0.25
(B) 0.145
(C) 3/20
(D) none of these

27. What is the probability that a number selected from the numbers (1, 2, 3,.....,15) is a multiple of 4?

(A) 1/5
(B) 4/5
(C) 2/15
(D) 1/3

28. If A, G, H are arithmetic, geometric and harmonic means between a and b respectively, then A,G,H are:

(A) in G.P
(B) in A.P
(C) in H.P
(D) Real numbers

29. If a = 3, r = 2, then nth term of G.P is?

(A) 2.3^{n-1}
(B) 3.2^{n}
(C) 3.2^{n+1}
(D) 3.2^{n-1}

30. Equations having a common solution are called?

(A) linear equations
(B) homogeneous equations
(C) simultaneous equations
(D) None of Above

PART II
APTITUDE

31. A clock is set right at 8 a.m. The clock gains 10 minutes in 24 hours will be the true time when the clock indicates 1 p.m. on the following day?
(A) 48 min. past 12.
(B) 46 min. past 12.
(C) 45 min. past 12.
(D) 47 min. past 12.

32. What was the day of the week on, 16th July, 1776?
(A) Tuesday
(B) Wednesday
(C) Monday
(D) Saturday

33. Find the number of triangles in the given figure?

(A) 28
(B) 32
(C) 36
(D) 40

34. The average of runs of a cricket player of 10 innings was 32. How many runs must he make in his next innings so as to increase his average of runs by 4?
(A) 76
(B) 79
(C) 85
(D) 87

35. If log 2 = 0.3010 and log 3 = 0.4771, the values of $\log_5 512$ is?
(A) 2.875
(B) 3.875
(C) 4.875
(D) 5.875

36. If selling price is doubled, the profit triples. Find the profit percent?
(A) 100%
(B) 200%
(C) 300%
(D) 400%

37. In how many different ways can the letters of the word 'LEADING' be arranged in such a way that the vowels always come together?
(A) 720
(B) 520
(C) 700
(D) 750

38. The speed of a car increases by 2 kms after every one hour. If the distance travelling in the first one hour was 35 kms. what was the total distance travelled in 12 hours?
(A) 456 kms
(B) 482 kms
(C) 552 kms
(D) 556 kms

39. The area of the largest circle that can be drawn inside a rectangle with sides 18cm by 14cm is
(A) 49
(B) 154
(C) 378
(D) 1078

40. In an election only two candidates contested 20% of the voters did not vote and 120 votes were declared as invalid. The winner got 200 votes more than his opponent thus he secured 41% votes of the total voters on the voter list. Percentage votes of the defeated candidate out of the total votes casted is:

(A) 47.5%
(B) 41%
(C) 38%
(D) 45%

41. How many integers, greater than 999 but not greater than 4000, can be formed with the digits 0, 1, 2, 3 and 4, if repetition of digits is allowed?

(A) 376
(B) 375
(C) 500
(D) 673

42. A sum of Rs.312 was divided among 100 boys and girls in such a way that the boy gets Rs.3.60 and each girl Rs. 2.40 the number of girls is

(A) 35
(B) 40
(C) 45
(D) 50

43. If you write down all the numbers from 1 to 100, then how many times do you write 3?

(A) 11
(B) 18
(C) 20
(D) 21

44. A pupil's marks were wrongly entered as 83 instead of 63. Due to that the average marks for the class got increased by half. The number of pupils in the class is:

(A) 45
(B) 40
(C) 39
(D) 37

45. Insert the missing number?
8,7,11,12,14,17,17,22, (….)

(A) 20
(B) 22
(C) 24
(D) 27

PART III
SUBJECT BASED
MATH

46. Let $f: R \to R$ be defined by $f(x) = x^2 + 1$. Then, pre-images of 17 and -3, respectively, are

(A) $\Phi, \{4, -4\}$
(B) $\{3, -3\}, \Phi$
(C) $\{4, -4\}, \Phi$
(D) $\{4, -4\}, \{2,2\}$

47. $\int \frac{dx}{\sin^2 x \cos^2 x}$ is equal to?

(A) $\tan x + \cot x + C$
(B) $(\tan x + \cot x)^2 + C$
(C) $\tan x - \cot x + C$
(D) $(\tan x - \cot x)^2 + C$

48. If the probabilities for A to fail in an examination is 0.2 and that for B is 0.3, then the probability that either A or B fails is

(A) >0.5
(B) 0.5
(C) ≤ 0.5
(D) 0

49. The system of equations
$\begin{pmatrix} 3 & -2 & 1 \\ 5 & -8 & 9 \\ 2 & 1 & a \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} b \\ 3 \\ -1 \end{pmatrix}$ has no solution if a and b are?

(A) $a = -3, b \neq 1/3$
(B) $a = 2/3, b \neq 1/3$
(C) $a \neq 1/4, b = 1/3$
(D) $a \neq -3, b \neq 1/3$

50. Ten different letters of alphabet are given. Words with five letters are formed from these given letters. Then the number of words which have at least one letter repeated is?

(A) 69760
(B) 30240
(C) 99748
(D) 99784

51. If there are two events A and B such that $P(A') = 0.3\ P(B) = 0.5$ and $P(A \cap B) = 0.3$, then $P(B|A \cup B')$ is:

(A) 3/8
(B) 2/3
(C) 5/6
(D) 1/4

52. If $(1 - x + x^2) = a_0 + a_1 x + a_2 x^2 + \ldots + a_{2n} x^{2n}$, then $a_0 + a_1 + a_2 + \cdots + a_{2n}$ equals.

(A) $\frac{3^n+1}{2}$

(B) $\frac{3^n-1}{2}$

(C) $\frac{1-3^n}{2}$

(D) $3^{n+\frac{1}{2}}$

53. Find the angle $\sin^{-1}\left(\sin\left(\frac{2\pi}{3}\right)\right)$.

(A) 2pi/3
(B) -pi/3
(C) pi/3
(D) -2pi/3

54. If $y = x + e^x$ then $\frac{d^2x}{dy^2}$ is:

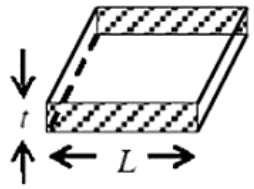
(A) e^x
(B) $-\frac{e^x}{(1+e^x)^3}$
(C) $-\frac{e^x}{(1+e^x)^2}$
(D) $\frac{-1}{(1+e^x)^3}$

55. The 10th common term between the series 3 + 7 + 11 + ... and 1 + 6 + 11 + ... is

(A) 191
(B) 193
(C) 211
(D) None of these

PHYSICS

56.



Consider a thin square sheet of side L and thickness t. made of a material of resistivity p. The resistance between two opposite faces, shown by the shaded areas in the figure is?

(A) Directly proportional to L
(B) Directly proportional to t
(C) Independent of L
(D) Independent of t

57. A charged particle goes unaccelerated in a region containing electric(E) and magnetic(B) fields with velocity v. Then,

(A) v must be perpendicular to both B and E.
(B) v must be parallel to both B and E.
(C) v must be perpendicular B and parallel to E.
(D) v must be perpendicular to E and parallel to B.

58. An electron is kept at the centre of a long solenoid having radius r and number of turns per unit length n. A current I starts flowing in the solenoid. With what minimum velocity this electron should be thrown perpendicular to the axis of solenoid so that it doesn't hit it.

(A) $\mu_0 \text{nire/m}$
(B) $\mu_0 \text{nire /2m}$
(C) $\mu_0 \text{nire /3m}$
(D) $\mu_0 \text{nire /4m}$

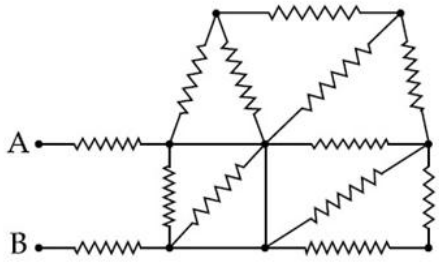
59. In the Young's double slit experiment using a monochromatic light of wavelength λ, the path difference (in terms of an integer n) corresponding to any point having half the peak intensity is?

(A) $(2n+1)\frac{\lambda}{2}$
(A) $(2n+1)\frac{\lambda}{4}$
(A) $(2n+1)\frac{\lambda}{8}$
(A) $(2n+1)\frac{\lambda}{16}$

60. An α-particle and a proton are accelerated from rest by a potential difference of 100V. after this, their de Broglie wavelengths are λ_α and λ_p respectively. The ratio $\frac{\lambda_p}{\lambda_\alpha}$, to the nearest integer, is?

(A) 2
(B) 3
(C) 4
(D) 5

61. In the given circuit all resistances are of value R ohm each. The equivalent resistance between A and B is:



(A) $\frac{5R}{3}$
(B) $3R$
(C) $\frac{5R}{2}$
(D) $2R$

62. An ideal capacitor of capacitance 0.2 pF is charged to a potential difference of 10 V. The charging battery is then disconnected. The capacitor is then connected to an ideal inductor of self inductance 0.5 mH. The current at a time when the potential difference across the capacitor is 5 V, is:

(A) 0.34 A
(B) 0.25 A
(C) 0.15 A
(D) 0.17 A

63. Locate the image formed by refraction in the situation shown in figure (18-W14). The point C is the centre of curvature.

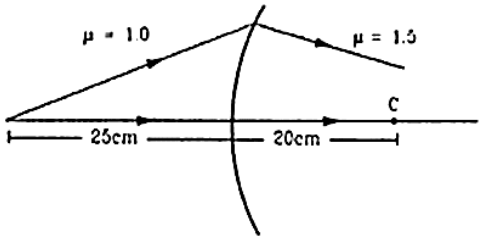


Figure 18-W14

(A) 100 cm right
(B) 100 cm left
(C) 50 cm right
(D) 50cm left

64. A thin flexible wire of length L is connected to two adjacent fixed points and carries a current I in the clockwise direction, as shown in the figure. When the system is put in a uniform magnetic field of strength B going into the plane of the paper. the wire takes the shape of a circle. The tension in the wire is?

(A) IBL

(B) $\frac{IBL}{\pi}$

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

(D) $\frac{IBL}{4\pi}$

65. A thin, metallic spherical shell contains a charge Q on it. A point charge q is placed at the centre of the shell and another charge q_1 is placed outside it as shown in figure (30-Q1). All the three charges are positive. The

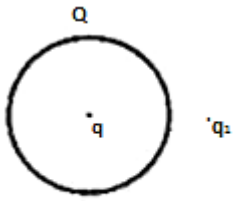


Figure 30-Q1

Force on the charge at the centre is?

(A) Towards left
(B) Towards Right
(C) upward
(D) Zero.

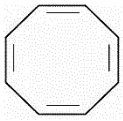
CHEMISTRY

66. For the two parallel reactions $A \xrightarrow{K_1} B$ and $A \xrightarrow{K_1} C$ what will be the activation energy if rate constants for the reactions are 4×10^3 sec^{-1} and 5×10^3 sec^{-1} also, activation energies are 150 kJ/mole and 200 KJ/mol respectively for both the reactions?

(A) 1600/9 KJ/mol
(B) 350 KJ/mol
(C) 1600 KJ/mol
(D) Cannot be determined

67. Which of the following structure is non aromatic?

(A)



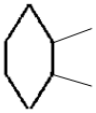
(B)

(C)

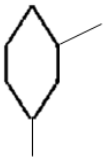
(D)

68. Total number of isomers is even for?

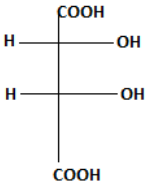
(A)



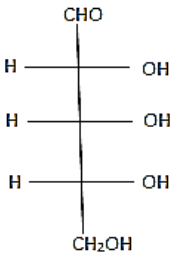
(B)



(C)



(D)



69. Which of the following is incorrect?

(A) During N_2^+ formation, one electron is removed from the bonding molecular orbital.

(B) During O_2^+ formation, one electron is removed from the anti bonding molecular orbital.

(C) During O_2^- formation, one electron is added to the bonding molecular orbitals.

(D) During CN^- formation, one electron is added to the bonding molecular orbitals.

70. Which of the following is flexidentate ligand?

(A) NH_3

(B) SO_4^{2-}

(C) H_2O

(D) $C_2O_4^{2-}$

71. Which of the following sulphides would not dissolve in hot and cold nitric acid?

(A) ZnS

(B) HgS

(C) MnS

(D) Bi_2S_3

72. In FCC unit Cell what fraction of edge length is not covered by atoms?

(A) 0.134

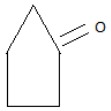
(B) 0.24

(C) 0.293

(D) None of these

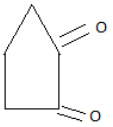
73. Which of the following product is formed from the ozonolysis of cyclopentene?

(A)



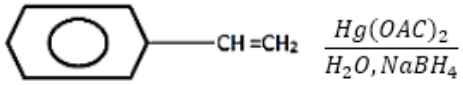
(B)

(C)

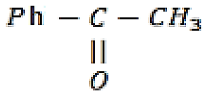


(D) None of these

74. What is the product for the following reactions:



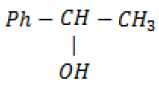
(A)



(B) Ph-CH_2-CHO

(C) Ph-CH_2-CH_2OH

(D)



75. For 1 molal aqueous solution of the following compounds, which one of the following will show the highest freezing point?

(A) $[Co(H_2O)_4\ Cl_2]\ Cl.2H_2O$

(B) $[Co(H_2O)_3\ Cl_3].\ 3H_2O$

(C) $[Co(H_2O)_6]\ Cl_3$

(D) $[Co(H_2O)_5Cl]\ Cl_2.H_2O$