JAMIA MALAYALI HALQA

Paper Code No- AB06/1 Question Booklet No 206321

ENTRANCE EXAMINATION-2016

B.Sc- Hons Physics/ Mathematics/ Chemistry/ B.Sc with Instrumentation/ B.Sc

SET A

ROLL NO. | | | | | | | | |

.....

Signature of Invigilator

Time: 1 Hour 45 Minutes Total Marks: 100

Instructions to Candidates

1. Do not write your name or put any other mark of identification anywhere in the OMR Answer Sheet. IF ANY MARK OF IDENTIFICATIONS IS DISCOVERED ANYWHERE IN OMR ANSWER SHEET, the OMR sheet will be cancelled, and will not be evaluated.
2. This Question Booklet contains this cover page and a total of 100 Multiple Choice Questions of 1mark. Space for rough work has been provided at the beginning and end. Available space on each page may also be used for rough work.
3. Each correct answer carries one mark.
4. There is negative marking for Multiple Choice Questions. For each wrong answer, 0.25 marks will be deducted.
5. USE OF CALCULATOR IS NOT PERMITTED.
6. USE/POSSESSION OF ELECTRONIC GADGETS LIKE MOBILE PHONE, iPhone, iPad, pager ETC. is not permitted.
7. Candidate should check the serial order of questions at the beginning of the test. If any question is found missing in the serial order, it should be immediately brought to the notice of the Invigilator. No pages should be torn out from this question booklet.
8. Answers must be marked in the OMR answer sheet which is provided separately. OMR answer sheet must be handed over to the invigilator before you leave the seat.
9. The OMR answer sheet should not be folded or wrinkled. The folded or wrinkled OMR/Answer Sheet will not be evaluated.
10. Write your Roll Number in the appropriate space (above) and on the OMR Answer Sheet. Any other details, if asked for, should be written only in the space provided.
11. There are four alternative answers to each question marked A, B, C and D. Select one of the answers you consider most appropriate and fill up the corresponding oval/circle in the OMR Answer Sheet provided to you. The correct procedure for filling up the OMR Answer Sheet is mentioned below.
12. Use Black or Blue Ball Pen only for filling the ovals/circles in OMR Answer Sheet while answering the Questions. For your Choice of answers darken the correct oval/circle completely. If the correct answer is 'B', the corresponding oval/circle should be completely fill and darkened as shown below.

CORRECT METHOD
(A) (B) (C) (D)

WRONG METHOD				
(A) (B) (C) (D)	(A) (B) (C) (D)	(A) (B) (C) (D)	(A) (B) (C) (D)	(A) (B) (C) (D)

SECTION CHEMISTRY

1. How many position isomers can be obtained by the mono substitution of toluene with chlorine?

(A) Four (B) Three
(C) Two (D) Five

2. Which of the following is temporary effect?

(A) Hyperconjugation (B) Resonance
(C) Electomeric (D) Inductive

3. Aromaticity of benzene is due to

(i) It possesses planar structure
(ii) It obeys Huckel's rule
(iii) It is cyclic
(iv) Delocalized π electrons

(A) (i) , (ii) and (iv) (B) (ii), (iii) and (iv)
(C) (i),(ii) and (iii) (D) All

4. The distinction between primary, secondary and tertiary alcohols can be made by

(i) Lucas reagent (ii) Victor Meyer test
(iii) Iodoform test

(A) (i) (B) (ii)
(C) (i) and (ii) (D) (i), (ii) and (iii)

5. The volume of hydrogen gas obtained at STP in litre when one gram of Al completely reacted with excess of aquos NaOH [Al=27]

(A) 1.24 (B) 1.66
(C) 2.49 (D) .83

6. Which is not standard state of element?

(A) Graphite (B) Oxygen gas
(C) Monoclinic sulphur (D) White-phosphorous

7. Which of the following is not an ore of Aluminium

(A) Cryolite (B) Feldspar
(C) Mica (D) Siderite

8. The ratio of radius of hydrogen atom of its second excited state to its ground state is

(A) 4:1 (B) 9:1
(C) 2:1 (D) 3:1

9. For the same speed which of the following gaseous molecule will have larger wave associate with it

(A) Hydrogen (B) Oxygen
(C) Nitrogen (D) Carbon dioxide

10. Which forms complex compound?

(A) Addition of ammonia in hard water
(B) Addition of EDTA in hard water
(C) Addition of copper sulphate in hard water
(D) Addition of potash alum in hard water.

11. The vapor density of the mixture of NO_2 and N_2O_4 is 40. The mass percentage of NO_2 in 100 gram of the mixture is

(A) 80 (B) 15
(C) 20 (D) 85

12. The hybridization of Al in Al_2Cl_6 is

(A) sp (B) sp^2
(C) sp^3 (D) sp^3d

13. Peroxide effect is observed for which of the following when added to propane

(A) HCl (B) HBr
(C) HI (D) All

14. False statement about diamond is

(A) It is an allotrope of carbon
(B) It has tetrahedral shape
(C) It has highest thermal conductivity
(D) It is hardest substance

15. Maximum covalence of nitrogen is

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

16. In periodic table anomalous behaviour of elements is generally observed in

(A) First period (B) Second period
(C) Third period (D) Fourth period

17. Pairs of elements having lowest ionization energy and highest Electron affinity

(A) Rb and F (B) Cs and F
(C) Rb and Cl (D) Cs and Cl

18. Which of the following orbital has highest angular momentum

(A) 5d (B) 6s
(C) 4f (D) 7p

19. A 2 litre closed container contains 2 gram hydrogen, 16 gram oxygen and 14 gram nitrogen at 27°C temperature. Assuming they are non-reacting, the pressure exerted in atmosphere by hydrogen is [R=0.082 lit-atm/mol/k]

(A) 24.6 (B) 12.3
(C) 6.15 (D) 3.075

20. Iodoform test is not given by

(A) Ethanol (B) Acetic acid
(C) Acetaldehyde (D) Acetone

21. Glycosidic linkage is found in
(A) Lactose (B) Glucose
(C) Fructose (D) D-xylose

22. For which of the following order of reaction the rate constant is equal to rate of reaction
(A) 0 (B) 1
(C) 2 (D) 3

23. The heat of combustion of carbon is 393.5 kj/mol. The calorific value of carbon is
(A) 393.5 kj (B) 4722 kj
(C) 32.80 kj (D) Can't be determined.

24. How much electricity in faraday (F) is passed to obtain one mole of Al from one mole of Al_2O_3 during electrolysis.
(A) 2 (B) 3
(C) 12 (D) 6

25. Which of the following is not a state function?
(A) Pressure (B) Volume
(C) Temperature (D) Heat

SECTION (MATHS)

26. If $\left(\frac{1-i}{1+i}\right)^{100} = \alpha + i\beta$, then
(A) $\alpha = 2, \beta = -1$ (B) $\alpha = 1, \beta = 0$
(C) $\alpha = 0, \beta = 1$ (D) $\alpha = -1, \beta = 2$

27. The angle between the lines $2x^2 - 7xy + 3y^2 = 0$ is
(A) 60^0 (B) 45^0
(C) $\tan^{-1}(7/6)$ (D) 30^0

28. Area of the quadrilateral formed by the lines $|x| + |y| = 1$ is
(A) 4 (B) 2
(C) 8 (D) none of these

29. The probability that a person will hit a target in shooting practice is 0.3. If he shoots 10 times, the probability that he hits the target is
(A) 1 (B) $1-(0.7)^{10}$
(C) $(0.7)^{10}$ (D) $(0.3)^{10}$

30. The value of $\lim_{x\to\infty} \frac{\sin x}{x}$ is
(A) 1 (B) 0
(C) -1 (D) none of these

31. If $G(x) = -\sqrt{25 - x^2}$, then $\lim_{x\to 1} \frac{G(x) - G(1)}{x - 1}$ has the value
(A) $\frac{1}{\sqrt{24}}$ (B) $\frac{1}{5}$
(C) $-\sqrt{24}$ (D) none of these

32. If $f(x) = (x+1)^{\cot x}$ be continuous at $x = 0$, then $f(0)$ is equal to
(A) 0 (B) $1/e$
(C) e (D) none of these

33. In the expansion of $\left(x - \frac{1}{3x^2}\right)^9$, the term independent of x is
(A) T_3 (B) T_4
(C) T_5 (D) none of these

34. The system of linear equations $x + y + z = 2$, $2x + y - z = 3$, $3x + 2y + kz = 4$ has a unique solution if
(A) $k \neq 0$ (B) $-1 < k < 1$
(C) $-2 < k < 2$ (D) $k = 0$

35. If
$$f(x) = \begin{vmatrix} 1 & x & x+1 \\ 2x & x(x-1) & (x+1)x \\ 3x(x-1) & 2(x-1)(x-2) & (x+1)x(x-1) \end{vmatrix},$$
Then $f(100)$ is equal to
(A) 0 (B) 1
(C) 100 (D) $k = 0$

36. If the circles $x^2 + y^2 = 9$ and $x^2 + y^2 + 8y + c = 0$ touch each other, then c is equal to
(A) 15 (B) -15
(C) 16 (D) -16

37. The function $f(x) = \cot^{-1} x + x$ increases in the interval
(A) $(1, \infty)$ (B) $(-1, \infty)$
(C) $(-\infty, \infty)$ (D) $(0, \infty)$

38. The maximum value of $\left(\frac{1}{x}\right)^x$ is

(A) e (B) e^a
(C) $e^{1/a}$ (D) $\left(\frac{1}{a}\right)^{1/a}$

39. The value of a so that the sum of the squares of the roots of the equation $x^2 - (a-2)x - a + 1 = 0$ assumes the least value, is

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

40. If $\int e^{\tan^{-1}x}\left(\frac{1+x+x^2}{1+x^2}\right)dx$ is equal to

(A) $xe^{\tan^{-1}x} + C$ (B) $x^2e^{\tan^{-1}x} + C$
(C) $\frac{1}{x}e^{\tan^{-1}x} + C$ (D) none of these

41. The value of $\int_{-1}^{1} x|x|dx$ is

(A) 2 (B) 1
(C) 0 (D) none of these

42. The points of extremism of $\varphi(x) = \int_1^x e^{-\frac{t^2}{2}}(1-t^2)dt$ are

(A) $x = 1, -1$ (B) $x = -1, 2$
(C) $x = 2, 1$ (D) $x = -2, 1$

43. The area bounded by the curve $y = 2x - x^2$ and the straight line $y = -x$ is given by

(A) 9/2 (B) 43/6
(C) 35/6 (D) none of these

44. The degree of the differential equation

$\left(\frac{d^3y}{dx^3}\right)^{2/3} + 4 - 3\frac{d^2y}{dx^2} + 5\frac{dy}{dx} = 0$ is

(A) 1 (B) 2
(C) 3 (D) none of these

45. The general solution of the differential equation $(1+y^2)dx + (1+x^2)dy = 0$ is

(A) $x - y = C(1-xy)$ (B) $x - y = C(1+xy)$
(C) $x + y = C(1-xy)$ (D) $x + y = C(1+xy)$

46. The maximum value of xy subject to $x + y = 8$ is

(A) 8 (B) 16
(C) 20 (D) 24

47. The perimeter of a ΔABC is 6 times the arithmetic mean of the sines of its angles. If the side a is 1, then the angle A is

(A) $\pi/6$ (B) $\pi/3$
(C) $\pi/2$ (D) $2\pi/3$

48. Number of solutions of the equation $\tan x + \sec x = 2\cos x$, lying in the interval $[0, 2\pi]$ is

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

49. The number of ways in which one can post 5 letters in 7 letter boxes is

(A) 35 (B) ${}^7P_5$
(C) 7^5 (D) 5^7

50. The number of zeros at the end of 70! is

(A) 16 (B) 5
(C) 7 (D) 70

SECTION (PHYSICS)

51. The dimensions of $\frac{1}{2}\varepsilon_0 E^2$, where ε_0 is permittivity of free space and E is the electric field, are:

(A) MLT^{-1}
(B) ML^2T^{-2}
(C) $ML^{-1}T^{-2}$
(D) ML^2T^{-1}

52. If the gravitational field strength at a height h above the Earth of radius R is same as at a depth of R/2, then h has value

(A) R (B) R/2
(C) $(\sqrt{2}-1)$ R (D) $\sqrt{2}$R

53. If R be the radius of Earth then the height of the geostationary satellite orbit from Earth's surface is approximately

(A) R (B) 2R
(C) 5R D) 10R

54. A simple pendulum of angle of swing 1^0 has time period T. If the angle of swing is increased to 2^0 then the new time period will be
(A) T
(B) 2T
(C) T/2
(D) T/4

55. Rainbow is formed due to following physical principles
(A) There is total internal reflection of light in water droplets
(B) There is angle of minimum deviation of light on refraction in water droplets
(C) Both of the above
(D) None of the above

56. Lunar eclipse will take place when
(A) The Sun is between the Moon and the Earth
(B) The Earth is between the Sun and the Moon
(C) The Moon is between the Sun and the Earth
(D) The Sun, the Moon and the Earth form an equilateral triangle in space

57. Tritium has a half life of 12.5 years. What fraction of a sample of pure tritium will remain undecided after 100 years
(A) 1/8
(B) 1/256
(C) 1/128
(D) 1/512

58. Energy released on burning fossil fuel has its origin in
(A) Geothermal energy
(B) solar energy
(C) Fission energy
(D) volcanic eruptions

59. A parallel plate capacitor having area A and separation between plates d has capacitance C. If the area of plates and separation between plates is changed to 2A and d/2 respectively, then the new capacitance is
(A) C/4
(B) C/2
(C) 2C
(D) 4C

60. If X is a planet in the night sky then
(A) Relative position of X will keep on changing with respect to other objects in the sky
(B) Relative position of X will remain same with respect to other objects in the sky
(C) X will be seen moving in a circular orbit in the sky
(D) X will be seen moving in an elliptical orbit in the sky

61. A rectangular object is sliding down an inclined plane at an increasing speed. If F is the frictional force on the object then
(A) F is increasing with time
(B) F is decreasing with time
(C) F is constant with time
(D) More information is needed for a definite conclusion

62. Insulators are bad conductors of electricity because in an insulator
(A) No electric field can be established
(B) No potential can be established
(C) There are no freely moving charge carriers
(D) There are no freely moving atoms

63. One solid and one hollow balls of same mass and diameter are rolled down simultaneously from same height on an inclined plane, then
(A) Hollow ball will reach first
(B) Solid ball will reach first
(C) Both balls will reach simultaneously
(D) More data is required for any conclusive statement

64. Lamps A and B are marked 100V, 100W and 100V, 50W respectively. If a potential difference of 200V is applied across a series combination of the two lamps then which lamp will burn brighter
(A) Both the lamps
(B) lamp A
(C) Lamp B
(D) none of the lamps

65. In an inelastic collision which quantity is not conserved
(A) Total energy
(B) kinetic energy
(C) Angular momentum
(D) linear momentum

66. Moderating material is used with nuclear fuel in nuclear power reactor as it

(A) Slows down neutrons to make them more effective for fission
(B) Slows down neutrons to make them less effective for fission
(C) Speeds up neutrons to make them more effective for fission
(D) Speeds up neutrons to make them less effective for fission

67. Poise is a unit of

(A) Pressure
(B) conductivity
(C) Surface tension
(D) viscosity

68. Consider a permanent electric dipole in an external uniform electric field. The dipole will experience

(A) Zero force and a non-zero torque
(B) zero force and a zero or non-zero torque
(C) Non-zero force and a zero torque
(D) non-zero force and a non-zero torque

69. An object is placed at 10 cm in front of a concave mirror of radius of curvature 15 cm, then the image formed is

(A) Magnified, real and inverted
(B) magnified, virtual and erect
(C) reduced, real and inverted
(D) reduced, virtual and erect

70. Height of Ionosphere from surface of Earth is approximately

(A) 80-300 km
(B) 50-100 km
(C) 200-400 km
(D) 300-600 km

71. In a solar cell, optimum band gap of active semiconductor used, for maximum efficiency is

(A) 3.0 eV
(B) 1.1 eV
(C) 2.0 eV
(D) 1.5 eV

72. Thermo-emf V of a thermocouple has the temperature dependence given by $V=\alpha T+\beta T^2$, where T is the temperature difference between the two junctions and α and β are constants. Cold junction is at a temperature of 300K. If the neutral temperature of the thermocouple is 500K, then the inversion temperature is

(A) 400K
(B) 500K
(C) 600K
(D) 700K

73. A long straight wire of radius R carries a steady current I uniformly distributed across the cross section of the wire. Magnetic field at the center of the wire is

(A) Zero
(B) $2\mu_0 I/\pi R$
(C) $\mu_0 I/\pi R$
(D) $\mu_0 I/2\pi R$

74. A series LCR resonant circuit contains $R=5\Omega$, L=8mH and C=2nF. Quality factor Q of the circuit is

(A) 10^4
(B) 400
(C) 10^{-4}
(D) 2.5×10^{-3}

75. If Young's double slit experiment is performed using white light, then on the screen

(A) No fringes will be observed
(B) Large number of coloured fringes will be observed
(C) Few colored fringes will be observed
(D) There will be a white central fringe and few colored fringes around it

SECTION
(GENERAL AWARENESS/REASONING/ GENERAL ENGLISH)

76. If + means X,- means +,X means/ and / means-, then 10+5X10/2-5 has a value of

(A) 35
(B) 45
(C) 30
(D) None of the above

77. Arrange the following words in alphabetical order and choose the one that comes at the last.
    (A) Romance
    (B) Rejoice
    (C) Reveal
    (D) Retain

78. From the given alternative words, select the one which cannot be formed using the letters of the given word.

    INFATUATION
    (A) Future
    (B) INFANT
    (C) ACTION
    (D) AUCTION

79. In a certain code POETRY is written as QONDSQX &OVER is written as PNUDQ. How MORE is be written in that code language?
    (A) LNNQD
    (B) NNNQD
    (C) NLNQD
    (D) NLPQD

Q80 AND 81
Select the letter/ word that could replace

80. Carbon: Diamond: :Corundum:?
    (A) Garnet
    (B) Ruby
    (C) Pukhraj
    (D) Pearl

81. BOQD: ERTG::ANPC:?
    (a) DSQF
    (b) FSHU
    (c) SHFU
    (d) DSQF

82. Find out the number that does not belong to the group of numbers for lack of common property.
    (A) 8
    (B) 42
    (C) 49
    (D) 35

83. Find out the set of number amongst the four sets of numbers given in the alternatives which is the most likely to the set given in the question:

    Given set (4, 25, 81)
    (A) (4, 36 ,79)
    (B) (9 ,48 ,81)
    (C) (16 ,64 ,100)
    (D) (9 ,49 ,143)

84. Yavanika (curtain) was introduced in Indian theatre by which of the following:
    (A) Shakas
    (B) Parthians
    (C) Greeks
    (D) Kushans

85. The kuka movement started in mid-nineteenth century in:
    (A) Western Punjab
    (B) Maharashtra
    (C) Bengal
    (D) Madhya pradesh

86. Who said 'swaraj is my birth right and I'll have it'?
    (A) Mahatma Gandhi
    (B) Bipin Chandra Pal
    (C) Gopal Krishna Gokhle
    (D) Bal Gangadhar Tilak

87. Process by which plants prepare their food is
    (A) Carbohydrolysis
    (B) Metabolic synthesis
    (C) Photosynthesis
    (D) Photosyntization

88. Study of bone is called
    (A) Orology
    (B) Oesteology
    (C) Seromology
    (D) Geology

89. A plant cell differ from animal in having
    (A) Chloroplast
    (B) Cell wall
    (C) Cell membrane
    (D) Nucleus

90. The book 'Midnight's Children has been written by:
(A) Arundhati Roy
(B) Tasleema Nasreen
(C) SalmanRushdie
(D) Kiran Desai

91. Ctrl, shift and Alt are called....keys.
(A) Function
(B) Modifier
(C) Alphanumeric
(D) Adjustment

92. Hydrogen was discovered by:
(A) Cavendish
(B) Lavosier
(C) Rutherford
(D) Scheele

93. Obscene
(A) Objectionable
(B) Indecent
(C) Displeasing
(D) Condemnable

94. Sumptuous
(A) Lavish
(B) Fancy
(C) Meager
(D) Irritable

95. Wary
(A) Cautions
(B) Accurate
(C) Quick
(D) Practical

96. Profound
(A) Profuse
(B) Boundless
(C) Deep
(D) Fathomless

97. Wanton
(A) Sportive
(B) Ardent
(C) Fragile
(D) Discreet

98. Grave
(A) Noble
(B) Inconsequential
(C) Solemn
(D) Senile

99. Parsimonious
(A) Scrimp
(B) Lavish
(C) Polite
(D) Meticulous

100. Reprimand
(A) Reward
(B) Appreciate
(C) Encourage
(D) Praise