ENTRANCE EXAMINATIONS – 2021
M.Sc. Neural and Cognitive Science

Marks: 100
Time: 2.00 hrs.   Hall Ticket No.

1. Write your Hall Ticket Number in the OMR Answer Sheet given to you. Also write the Hall Ticket Number in the space provided above.

2. Read carefully the following instructions:

a. This Question paper has Two Sections: Part – A and Part – B.

b. Part-A has 40 and Part-B has 60 objective type questions of one mark each.

c. There is negative marking for all the questions in Parts A and B. Each wrong answer carries -0.33 mark

d. Answers are to be marked on the OMR answer sheet following the instructions provided there upon.

e. Hand over the OMR answer sheet at the end of the examination to the Invigilator.

f. No additional sheets will be provided. Rough work can be done in the question paper itself/space provided at the end of the booklet.

Part-A

1. In the four words below, three of them are related in meaning. Find the odd one out.

    A. contrition
    B. remorse
    C. credence
    D. penitence

2. According to the theory of evolution

    A. Humans evolved from chimpanzees
    B. Humans and chimpanzees have a common ancestor
    C. Humans are the ultimate evolved species
    D. Humans are superior than viruses

3. A box of twenty pens has an average cost of Rs. 22 per pen. There are eleven red pens having an average cost equal to the average cost of the pens in the box. There are seven blue pens having an average cost of Rs. 20 per pen. What is the average cost of the two green pens?

    A. Rs. 25
    B. Rs. 29
    C. Rs. 51
    D. None of the above

4. Within the limits of _____, the company claims that they can adapt _____ models to specific customer requirements.

    A. feasibility, standard
    B. facility, stock
    C. capability, contrive
    D. chance, predict

5. Choose the most appropriate pair to fill in the blanks in the same order

The exclusion of the _____ characters does not change the resulting most _____ trees.

A. uninformative, parsimonious
B. meandering, determined
C. pleasant, potential
D. livable, fruiting

6. Choose the most appropriate filler for the gap

Light : levity : : sorry : _

A. Pain
B. Sorrow
C. Malady
D. Pain

7. abetting : thwarting is like

A. facilitating : mentoring
B. prejudicial : uncolored
C. distributing : preventing
D. enfeebling : plodding

8. Binary number representation for the number 14 in decimal system, is

A. 1110
B. 1101
C. 1111
D. 1100

9. Arrange to make a meaningful sentence in English:

P of some areas are available in many school
Q regional reports on the geology and mineral resources
R and public libraries

S or they may be purchased from the Survey

A. QPSR
B. QRPS
C. QPRS
D. RQSP

10. If in a certain coding language, MASK is written as QEWO, then SOAP will be written as:
   A. WTCM
   B. WSET
   C. WKET
   D. XSFT

11. Find the one which does not belong to that group?
   A. 27
   B. 37
   C. 47
   D. 67

12. C is the centre of a circle of diameter 16 cm. The tangent at a point A on the circle cuts a line through C at B such that AB = 15 cm. Find CB.
   A. 15 cm
   B. 16 cm
   C. 17 cm
   D. 11.5 cm

13. If Joke : Laughter, then
   A. Story : Mystery
   B. Horror : Fear
   C. Eyes : Tears
   D. Actor : Acting

14. If you are a fitness walker, you do not need to go to a health gym. You also do not need any fitness equipment for workout. All you need is a pair of comfortable athletic shoes. This paragraph supports which of the following statements:

A. Fitness walking is better than weight lifting
B. Walking outdoors provides more health benefits than walking indoors
C. Fitness walking is an effective and convenient form of exercise
D. Poorly designed shoes can cause foot injuries

15. Abhay is son of Amrit's father's sister. Pawan is son of Tara who is mother of Vinay and grandmother of Amrit. Hardeep is father of Nikunja and grandfather of Abhay. Tara is wife of Hardeep. How is Abhay related to Tara?
A. Grandson
B. Son
C. Data inadequate
D. None of these

The following passage refers to questions 16 through 19.

Marie Curie was one of the most accomplished scientists in history. Together with her husband, Pierre, she discovered radium, an element widely used for treating cancer, and studied uranium and other radioactive substances. Pierre and Marie's amicable collaboration later helped to unlock the secrets of the atom.

Marie was born in 1867 in Warsaw, Poland, where her father was a professor of physics. At an early age, she displayed a brilliant mind and a blithe personality. Her great exuberance for learning prompted her to continue with her studies after high school. She became disgruntled, however, when she learned that the university in Warsaw was closed to women. Determined to receive a higher education, she defiantly left Poland and in 1891 entered the Sorbonne, a French university, where she earned her master's degree and doctorate in physics.

Marie was fortunate to have studied at the Sorbonne with some of the greatest scientists of her day, one of whom was Pierre Curie. Marie and Pierre were married in 1895 and spent many productive years working together in the physics laboratory. A short time after they discovered radium, Pierre was killed by a horse-drawn wagon in 1906. Marie was stunned by this horrible misfortune and endured heart-breaking anguish. Despondently she recalled their close relationship and the joy that they had shared in scientific research. The fact that she had two young daughters to raise by herself greatly increased her distress.

Curie's feeling of desolation finally began to fade when she was asked to succeed her husband as a physics professor at the Sorbonne. She was the first woman to be given a professorship at the world-famous university. In 1911 she received the Nobel Prize in

chemistry for isolating radium. Although Marie Curie eventually suffered a fatal illness from her long exposure to radium, she never became disillusioned about her work. Regardless of the consequences, she had dedicated herself to science and to revealing the mysteries of the physical world.

16. The Curies' _____ collaboration helped to unlock the secrets of the atom.
    A. friendly
    B. competitive
    C. courteous
    D. industrious

17. When she learned that she could not attend the university in Warsaw, she felt _____.
    A. hopeless
    B. annoyed
    C. depressed
    D. worried

18. Marie _____ by leaving Poland and traveling to France to enter the Sorbonne.
    A. challenged authority
    B. showed intelligence
    C. behaved
    D. was distressed

19. Even though she became fatally ill from working with radium, Marie Curie was never

    _____.
    A. troubled
    B. worried
    C. disappointed
    D. sorrowful

20. Subhas ranked ninth from the top and thirty-eighth from the bottom in a class. How many students are there in the class?

    A. 45
    B. 46
    C. 47
    D. 48

21. Sumita ranks eighteenth in a class of 49 students. What is her rank from the last?

    A. 18
    B. 19
    C. 31
    D. 32

22. Find the word that best describes the relation as the first pair of words

        Assam : Bihu :: Kerala :_?

    A. Kathakali
    B. Kuchipudi
    C. Kathak
    D. Bharatnatyam

23. Find the word that best describes the relation as the first pair of words Moon : Satellite ::
    Earth :_?

    A. Sun
    B. Planet
    C. Galaxy
    D. Asteroid

24. In the following letter series, some of the letters are missing which are given in that order as
    one of the alternatives below it. Choose the correct alternative.

        a_ba_b_b_a_b

    A. abaab
    B. abbab
    C. aabba
    D. bbabb

25. In the following letter series, some of the letters are missing which are given in that order as
    one of the alternatives below it. Choose the correct alternative.

        _stt_tt_tts_

A. tsts

B. tsst

C. ttst

D. sstt

26. Choose out the odd one.

A. Algiers

B. Tokyo

C. Beijing

D. New York

27. Choose out the odd one.

A. Rose

B. Marigold

C. Lotus

D. Tulip

28. You go North, turn right, then right again, and then go to the left. In which direction are you now?

A. East

B. North

C. South

D. West

29. Manik walked 40 metres towards North, then took a left turn and walked 20 metres. He again took a left turn and walked 40 metres. How far and in which direction is Manik from the starting point?

A. 20 metres East

B. 40 metres North

C. 30 metres South

D. 20 metres West

30. Choose the most appropriate pair to fill in the blanks in the same order

With little likelihood of any _____ jump in tax revenues or exports in the next few years, the country's _____ on foreign loans will continue. .

A. dramatic, dependence

B. tepid, viewing

C. pleasant, potential

D. lively, embedding

31. Find the word that best describes the relation as the first pair of words

Elephant: Trunk :: Grasshopper: ?

A. Eyes

B. Mouth

C. Antennae

D. Skin

32. If John is the youngest son of Judy - who is the wife of my grandfather's only child. How is John related to me?

A. Younger brother

B. Husband

C. Bother

D. Nephew

33. A pipe can fill a tank in 15 hours. Due to a leak in the bottom of the tank, it is filled in 25 hours. If the tank is full, how much time will the leak take to empty it completely?

A. 37.5 hours

B. 25 hours

C. 20 hours

D. Cannot be predicted

34. In what time will $1250 amount to $1400 at 6% per annum?

A. 1.5 years

B. 2 years

C. 0.006 years

D. 1/9 years

35. Find the word that closely relates to 'gratitude'.

A. Indebtedness
B. Morality
C. Courage
D. Lucky

36. The process through which plants give off excess water through their leaves is called
    A. Osmosis
    B. Transpiration
    C. Respiration
    D. Assimilation

37. Find the remainder when 1395 x 1671 x 1983 is divided by 11
    A. 5067
    B. 1
    C. 222
    D. 6

38. One who hates marriage is called a
    A. Mysogynist
    B. Misogamist
    C. Mysogamist
    D. Misogynist

Fill in the appropriate word
39. Her presence was a ------------- in disguise.
    A. Benediction
    B. Commiseration
    C. Adversary
    D. Fecund

40. The diameter of a bicycle wheel is 14 inches. How many revolutions will the wheel make in travelling one mile?
   A. 689
    B. 19
    C. 5000
    D. 1442

PART - B

41. Convex lenses are able to correct the hypermetropia because

    A. convex lens makes the image sharper
    B. in hypermetropia the image falls behind the retina
    C. in hypermetropia the image falls in front of the retina
    D. convex lens makes the real image fall on the lens of the eye

42. If $y^2 / (x+3) = p$ then $x =$

    A. $y^2/p+3$
    B. $y^2/p-3$
    C. $y^2/(p-3)$
    D. $y^2(p-3)$

43. What is the voltage across R2, if R1=R3=100ohm, R2=200ohm and V=10V ?
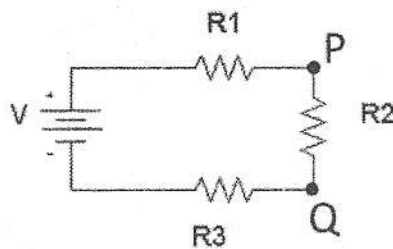
    A. 5V
    B. 6V
    C. 2V
    D. 4V

44. Our eye brings in to focus objects at different depths by

    A. Finely moving the lens away or towards the retina
    B. Adjusting the focal length of the lens
    C. By contracting the pupil
    D. By dilating the pupil

45. What is the mean of the following set of measurements?

   1, 2.5, 3.2, -4, 0.1, 10, -7.3, 1.2, 2.5, -2

   A. 7.2
   B. 0.36
   C. 0.72
   D. 3.6

46. Odor from a scent bottle reaches you fast because of:
   A. diffusion
   B. turbulent flow
   C. drift
   D. scattering

47. Which among the following is the simplification of the expression $(a+b)^2(a-b)$?

   A. $a^3+3ab-b^3$
   B. $a^3+a^2b-ab^2-b^3$
   C. a^2+b^2-2ab
   D. a^3-b^3

48. Two liquids A and B are heated for the same duration under similar conditions. Temperature of A is double that to B at the end of the treatment.

   A. We can say nothing about the specific heat capacity
   B. A has higher specific heat capacity than B
   C. B has higher specific heat capacity than A
   D. Specific heat capacity of A and B depends on the time for which the heating was done.

49. What is the result of
$$[1,0,-1] \cdot [132] + [3,2,1] =$$

   A. [2, 1, 0]
   B. [3, 2, 1]
   C. [2, 2, 3]
   D. [4, 0, -3]

50. If $f(x) = e^x - x$, what is $f(\ln(y-2))$?

    A. $\ln(y-2) + (y-2)$
    B. $e^{y-2} + \ln(y-2)$
    C. $e^{y-2} - \ln(y-2)$
    D. $(y-2) - \ln(y-2)$

51. Which is the false statement about light and sound?

    A. Light has very short wavelength while sound has larger wavelengths
    B. Both light and sound can diffract
    C. Both light and sound can be reflected
    D. Both light and sound can have different velocities in different media

52. The distance between the following pair of points (2,3) and (4,2) is
    A. $\sqrt{5}$
    B. $2\sqrt{2}$
    C. 2
    D. 4

53. Which of the following statements is definitely true?

    A. There should be at least one obtuse angle in a triangle.
    B. There are at least 2 acute angles in a triangle.
    C. A triangle can have at most 2 obtuse angles.
    D. A triangle can have at most 2 acute angles.

54. If a bee is traveling straight from its hive to a cluster of flowers with velocity v m/sec for half the total time to reach the flowers. 2v m/sec for quarter of the time and v/4 m/sec for the rest to the time. What is the bee's average velocity?

    A. v m/sec
    B. 17v/16 m/sec
    C. 5v/16 m/sec
    D. 9v/8 m/sec

55. The resting membrane potential of a nerve cell is about:
    A. 70 mV
    B. 0 mV
    C. 40 mV
    D. – 70 mV

56. The two cerebral hemispheres are connected by:
    A. Spinal cord
    B. Cerebellum
    C. Hippocampus
    D. Corpus callosum

57. Spinal cord is the part of:
    A. Central Nervous system
    B. Peripheral Nervous system
    C. Enteric nervous system
    D. All of these

58. Which of the following is not a part of five kingdom classification?
    A. Protista
    B. Archaea
    C. Plantae
    D. Fungi

59. A Nissl body is mainly composed of:
    A. Nucleolus
    B. Mitochondria
    C. Endoplasmic reticulum
    D. Vacuoles

60. Which of the following requires ultracentrifugation for its isolation from a cell?
    A. Nucleus
    B. Mitochondria
    C. Soma
    D. Cell membrane

61. A zoologist recovered some tissue from preserved skin of a woolly mammoth. Further genetic analysis requires DNA isolation and increasing its amount. Which one of the following techniques would be most useful for increasing the amount of DNA?
    A. RFLP analysis
    B. Polymerase chain reaction (PCR)
    C. Electroporation
    D. Chromatography

62. Match the proteins / molecules listed in column I with the cellular location mentioned in the column II.

Column I	Column II
I) Galactosyl transferase	(i) Vesicles
II) Cytochrome oxidase	(ii) Cytosol
III) Clathrin	(iii) Golgi complex
IV) Tubulin	(iv) Mitochondria

    A. I-ii; II-iii; III-i; IV-iv
    B. I-iii; II-iv; III-i; IV-ii
    C. I-iii; II-iv; III-ii; IV-i
    D. I-iv; II-iii; III-ii; IV-i

63. Which one of the following properties of the myeloma cells is used in the hybridoma technology to generate monoclonal antibody?
    A. lack of thymidylate synthase
    B. over-expression of hypoxanthine-guanine phosphoribosyl transferase
    C. over-expression of inosine 5`-monophosphate cyclohydrolase
    D. lack of hypoxanthine-guanine phosphoribosyl transferase

64. Which one of the following techniques is used to monitor RNA transcripts, both temporally and spatially?
    A. Northern blotting
    B. *In situ* hybridization

C. Southern blotting

D. Western blotting

65. The concentration of which neurotransmitter decreases in Alzheimer's disease patients?
   A. Serotonin
   B. GABA
   C. Acetylcholine
   D. Dopamine

66. Somatosensory cortex is in the:
   A. Frontal lobe
   B. Occipital lobe
   C. Parietal lobe
   D. Temporal lobe

67. Which statistical technique is used to check significant difference between the means of two or more groups?
   A. Chi-square
   B. t-test
   C. Regression
   D. ANOVA

68. The computational methodology that tries to find the best matching between two molecules, a receptor and ligand is called _____.
   A. Molecular fitting
   B. Molecular matching
   C. Molecular docking
   D. Molecule affinity checking

69. Arrange the following structures of a typical neuron from soma to axon terminals: i) synaptic knob, ii) myelin sheath, iii) dendritic spines, iv) Nissl bodies.
   A. i-ii-iii-iv
   B. iv-ii-iii-i
   C. iii-iv-ii-i
   D. i-iv-iii-ii

70. The retinal cells responsible for colour vision in vertebrates are:

A. Rods.

B. Cones.

C. Pyramids.

D. Cylinders.

71. In genetics, dominance:

A. Implies the heterozygote is phenotypically identical to the homozygote.

B. Happens in haploid animals.

C. Implies the heterozygote is genotypically identical to the homozygote.

D. Is a social construct.

72. Chlorophyll is required for:

A. Respiration.

B. Photosynthesis.

C. Transpiration.

D. Structural stability.

73. An aqueous solution turns blue litmus paper red. What could be the pH of the solution?

A. 6

B. 7

C. 8

D. 9

74. Serine proteases are named so because:

A. Their first amino acid is serine.

B. The catalytic mechanism is initiated by one of the serines of the enzyme.

C. They hydrolyze peptide bond in the C-terminal of the serine present at the cleavage site.

D. They hydrolyze peptide bond in the N-terminal of the serine present at the cleavage site.

75. Which of the following statements about a point mutation is *incorrect*??

A. Can be induced by chemicals.

B. Can be responsible for genetic disease.

C. Can be mapped by DNA sequencing.

D. Can be detected easily by Northern blotting.

76. Polyuria can occur in:

    A. Diabetes mellitus.
    B. Heat stroke.
    C. Diarrhoea.
    D. Hyperthermia.

77. Which of the following is not a bone in the middle ear?

    A. Hammer.
    B. Anvil.
    C. Stirrup.
    D. Crowbar.

78. Which gas constitutes the second highest percentage in exhaled air?

    A. Nitrogen.
    B. Carbon dioxide.
    C. Oxygen.
    D. Argon.

79. According to which evolutionary theory, there are long periods without significant evolutionary changes interrupted by short episodes of rapid evolution?

    A. Punctuated equilibrium.
    B. Saltation.
    C. Mutation.
    D. Neutrality.

80. The idea that for any particular trait, the pair of alleles of each parent separate and only one allele from each parent passes to an offspring is Mendel's principle of:
    A. Segregation
    B. Independent assortment
    C. Hybridization
    D. All of these

81. If you throw two dice one time, what is the probability of getting a sum of seven.

    A. 1/12
    B. 7/36

C. 5/36

D. 1/6

82. AMPA receptors are generally activated by
   A. Serotonin
   B. GABA
   C. Acetylcholine
   D. Glutamate

83. In a capacitance, the charge on the plates given a voltage between them is
   A. proportional to the area of the plates and the distance between them
   B. proportional to the area of the plates and inversely proportional to the distance between them
   C. inversely proportional to the area of the plates and proportional to the distance between them
   D. inversely proportional to the area of the plates and the distance between them

84. A beam of electrons projected along +x-axis, experiences a force due to a magnetic field along the +y/-axis. What is the direction of the magnetic field?
   A. Cannot be predicted
   B. Along +x-axis
   C. Along +y-axis
   D. Along +z-axis

85. Which of the following is wrong? Different isotopes of Fluorine has

   A. Same number of electrons
   B. Same number of neutrons
   C. Same number of protons
   D. Same atomic number

86. Noam Chomsky is known for his:

   A. TG grammar
   B. Functional linguistics
   C. Literary criticism

D. Economics

87. The role of Anterior cingulate cortex primarily is:

A. Attentional orienting
B. Conflict resolution
C. Temperature control
D. Language activation

88. Paul Broca was known for:

A. Discovering cerebellum
B. Inventing a novel brain imaging technique
C. Discovering language areas in the brain
D. Naming the cerebral cortex

89. Which area of the brain controls attention?

A. Primary auditory cortex
B. Insula
C. Frontal lobes
D. Wernicke's area

90. Lexicon is a collection of:

A. features
B. words
C. brain areas
D. sentences

91. Phonological loop and visuospatial sketch pad are components of:

A. Autobiographical memory
B. Working memory
C. Long-term memory

D. Episodic memory

92. Watson and Skinner were:

    A. Behaviourists

    B. Cognitive scientists

    C. Philosophers

    D. Computer scientists

93. Gestalt psychologists discovered:

    A. Laws of social condition

    B. Laws of motor control

    C. Laws of perception

    D. Laws of situational awareness

94. Cognitive Science began in:

    A. China

    B. France

    C. USA

    D. India

95. A dog salivates in the presence of a bowl of food. The dog is presented with a bowl of food along with the sound of a bell. Then the dog salivates when the bell is presented without the bowl of food. In this example of classical conditioning:

    A. Food is the conditioned stimulus; sound of bell is the unconditioned stimulus

    B. Food is the unconditioned stimulus; sound of bell is the conditioned stimulus

    C. Both food and the sound of bell are conditioned stimuli

    D. Both food and the sound of bell are unconditioned stimuli

96. Electroencephalography (EEG) records:

    A. the number of neurons in the brain.

B. electrical impulses from the brain

C. chemical activity in the cranial nerves.

D. blood flow to the brain

97. Seeing out of the corner of your eye, often in sports and driving, can be accomplished due to:

   A. Peripheral vision

   B. Tunnel vision

   C. Attention capture

   D. Astigmatism

98. Which of the following is not an eye-movement measure?

   A. Pupil dilation

   B. Fixations

   C. Saccades

   D. BOLD signals

99. Alan Turing's name is associated with:

   A. Artificial Intelligence

   B. Aphasia

   C. Attention

   D. Memory

100.What is dyslexia?

   A. Reading disorder

   B. a disorder of the eye

   C. a disorder of the hands

   D. Walking disorder

University of Hyderabad
Entrance Examinations - 2021

School/Department/Centre: Centre for Neural and Cognitive Sciences, School of Medical Sciences
Course/Subject: MSc Neural and Cognitive Science

Q. No.	Answer	Q. No.	Answer	Q. No.	Answer	Q. No.	Answer
1	C	26	D	51	A	76	A
2	B	27	C	52	A	77	D
3	B	28	A	53	B	78	C
4	A	29	D	54	B	79	A
5	A	30	A	55	D	80	A
6	B	31	D	56	D	81	D
7	B	32	A	57	A	82	D
8	A	33	A	58	B	83	B
9	C	34	B	59	C	84	D
10	B	35	A	60	B	85	B
11	A	36	B	61	B	86	A
12	C	37	D	62	B	87	B
13	B	38	B	63	D	88	C
14	C	39	A	64	A	89	C
15	A	40	D	65	C	90	B
16	A	41	B	66	C	91	B
17	B	42	B	67	D	92	A
18	A	43	A	68	C	93	C
19	C	44	B	69	C	94	C
20	B	45	C	70	B	95	B
21	D	46	B	71	A	96	B
22	A	47	B	72	B	97	A
23	B	48	C	73	A	98	D
24	D	49	A	74	B	99	A
25	B	50	D	75	D	100	A

Signature: