

**ENTRANCE EXAMINATIONS,
(Ph.D. Admissions- January, 2019, session)**

Ph.D. (Cognitive Science)

Max. Marks: 80

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- I and Part- II .
- b. Part - I has 40 and Part - II has 40 objective type questions of one mark each.
- c. There is negative marking for all the questions in parts I and II. 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 I: Research Methodology

1. When is a null hypothesis in statistics rejected (with a confidence level of 95%):
 - A) When $p = 0.05$
 - B) When $p < 0.05$
 - C) When $p > 0.05$
 - D) None of the above
2. A list of 5 scores is: 70, 64, 85, 80, 92. What is the median for this list?
 - A) 74
 - B) 76
 - C) 77
 - D) 80
3. A candidate attempted 12 questions and secured full marks in all of them. If he obtained 60% in the test and all questions carried equal marks, then what is the number of questions in the test?
 - A) 36
 - B) 30
 - C) 25
 - D) 20
4. A cuboid has six sides of different colours. The red side is opposite to black. The blue side is adjacent to white. The brown side is adjacent to blue. The red side is face down. Which one of the following would be the opposite to brown?
 - A) Red
 - B) Black
 - C) White
 - D) Blue
5. A is B's sister. C is B's mother. D is C's father. E is D's mother. Then, how is A related to D?
 - A) Grandmother
 - B) Granddaughter
 - C) Grandfather
 - d) Daughter
6. 120, 99, 80, 63, 48, ?
 - A) 35
 - B) 38
 - C) 39
 - D) 40

7. In the series 2, 6, 18, 54, what will be the 8th term ?

- A) 4370
- B) 4374
- C) 7443
- D) 7434

8. What is Interquartile range?

- A) $Q_3 - Q_1$
- B) $Q_3 + Q_1$
- C) Q_2
- D) $Q_1 + Q_2 + Q_3$

Where Q_1 , Q_2 , Q_3 are first, second and third quartiles respectively.

9. Pick the choice that best completes the following sentence. If a relationship between two variables is called statistically significant, it means the investigators think the variables are

- A) related in the population represented by the sample.
- B) not related in the population represented by the sample.
- C) related in the sample due to chance alone.
- D) very important.

10. In a normal distribution,

- A) Mean is always greater than the median
- B) Mean is always lesser than the median
- C) Mean is equal to the median
- D) There is no relationship between the mean and the median

11. Which one of the following measurement does not divide a set of observations into equal parts?

- A) Quartiles
- B) Standard Deviations
- C) Deciles
- D) Median

12. What is the range of values that the Pearson correlation coefficient can take:

- A) 0 to 1
- B) less than 1
- C) greater than 1
- D) -1 to +1

13. In the design of a survey, which of the following minimises response bias?

- A) Increase the sample size
- B) Decrease the sample size
- C) Randomly select the sample
- D) Increase the number of questions in the survey

14. Which of the following is spelt correctly?

- A) rendezvous
- B) rondavous
- C) rendevous
- D) randavous

15. There are twenty four students in a certain class. For every nine girls there are three boys. How many girls and how many boys are there in the class?

- A) 19 and 5
- B) 18 and 6
- C) 15 and 9
- D) 14 and 10

16. 5, 26, 131, 656, ?

- A) 1285
- B) 3281
- C) 1321
- D) None of the above

17. Twenty men and 20 women participated in a study examining height differences between men and women. During the analysis of the data from this experiment using repeated measures ANOVA, gender of the participants:

- A) Would be considered as a within-subjects factor
- B) Would be considered as a between-subjects factor
- C) Would be considered as a dependent variable
- D) Would be not included in the analysis

18. Which one of these statistics is unaffected by outliers?

- A) Mean
- B) Interquartile range
- C) Standard deviation
- D) Range

19. Choose the alternative closest in meaning to the given word.
Virtuoso:

- A) skilled performer
- B) Amateur
- C) good person
- D) professional

A study was done to compare the lung capacity of coal miners to the lung capacity of farm workers. The researcher studied 200 workers of each type. Other factors that might affect lung capacity are smoking habits and exercise habits. The smoking habits of the two worker types are similar, but the coal miners generally exercise less than the farm workers.

20. Which of the following is the explanatory variable in this study?
- A) Exercise
 - B) Lung capacity
 - C) Smoking or not
 - D) Occupation
21. Which of the following is a confounding variable in this study?
- A) Exercise
 - B) Lung capacity
 - C) Smoking or not
 - D) Occupation
22. Which one of the following variables is not categorical?
- A) Weight of a person.
 - B) Gender of a person
 - C) Choice on a test item
 - D) Marital status of a person
23. Select the pair that best expresses the relationship similar to that expressed in the original pair.
Nuance: Subtle
- A) Pun: Sarcastic
 - B) Fib: Honest
 - C) Inquiry: Discreet
 - D) Hint: Indirect
24. Choose the correct alternative to complete the meaning of the given sentence
Her written statements failed to be consistent _____ what she had said earlier
- A) on
 - B) with
 - C) in
 - D) to
25. Which one of the following alternatives is spelt correctly?
- A) extacy
 - B) ecstasy
 - C) ecstacy
 - D) extasy
26. Writing on the wall means
- A) graffiti
 - B) obvious truth
 - C) foreboding
 - D) prediction

27. A list of 5 pulse rates is: 70, 64, 80, 74, 92. What is the median for this list?

- A) 74
- B) 76
- C) 77
- D) 80

28. The average age of a father and his only son is 25% more than the average age of that boy and his mother. When that boy was born, his mother was 30 years old and his father was 40 years old. Find the present age of father.

- A) 55
- B) 48
- C) 65
- D) 45

29. In how many ways the letter 'SOLVING' can be rearranged to make 7 letter words such that none of the letters repeat?

- A) 49
- B) 5040
- C) 77
- D) None of the above

30. What is the missing letter in this series?

b e h k n ? t

- A) q
- B) r
- C) s
- D) u

31. The average age of a group of 5 students was 10. The average age increased by 4 years when 2 new students joined the group. What is the average age of the two new students who joined the group?

- A) 15
- B) 20
- C) 22
- D) 24

32. There are twenty four students in a certain class. For every nine girls there are three boys. How many girls and how many boys are there in the class?

- A) 19 and 5
- B) 18 and 6
- C) 15 and 9
- D) 14 and 10

33. When is the performance on a 2AFC task considered to be at chance level?

- A) When $d' = 0$
- B) When $d' < 0$
- C) When $d' = 1$
- D) When $d' = 1$

34. In a semantic/category fluency task, how much time is generally given to participants to produce words in each category?

- A) 3 minutes
- B) 1 minute
- C) 30 seconds
- D) 5 minutes

35. _____ bias occurs when participants or items are not chosen at random but instead are selected so that an attribute is over- or under-represented.

- A) Response
- B) Reliability
- C) Validity
- D) Sampling

36. Which of the following findings is not a correlation?

- A) As testosterone increases so too does verbal aggression
- B) As download prices increase sales will decrease
- C) Women scored higher than men on narcissism
- D) None of these

37. One use of a regression line is

- A) to determine if any x-values are outliers.
- B) to determine if any y-values are outliers.
- C) to determine if a change in x causes a change in y.
- D) to estimate the change in y for a one-unit change in x.

38. Pick the choice that best completes the following sentence. If a relationship between two variables is called statistically significant, it means the investigators think the variables are

- A) related in the population represented by the sample.
- B) not related in the population represented by the sample.
- C) related in the sample due to chance alone.
- D) very important.

39. Which of these numbers cannot be a probability?

- 1. -0.00001
- 2. 0.5
- 3. 0
- 4. 1

40. Previous probabilities in Bayes Theorem that are changed with help of new available information are classified as

- 1. independent probabilities
- 2. posterior probabilities
- 3. interior probabilities
- 4. dependent probabilities

Part B
Cognitive Science

41. The words "mango" and "man" are:
A) phonological cohorts of each other
B) semantic competitors of each other
C) cross-linguistic competitors of each other
D) phonological rhymes of each other
42. What does SOA stand for?
A) Stimulus onset asynchrony
B) Stimulus offset asynchrony
C) Stimulus on acquisition
D) None of the above
43. _____ lobes control higher order cognitive skills; _____ lobes control vision.
A) Occipital;temporal
B) Frontal;occipital
C) Occipital;frontal
D) Occipital;parietal
44. _____ is a disorder in which there is lack of awareness in one visual field due to damage to the contralateral side of the brain.
A) Visual neglect
B) Agnosia
C) Blindsight
D) Hemi motor neglect
45. In signal detection theory, how is d' prime calculated?
A) $Z(\text{Hits}) - Z(\text{False alarms})$
B) $Z(\text{Hits}) + Z(\text{False alarms})$
C) $Z(\text{Hits}) * Z(\text{False alarms})$
D) $Z(\text{Hits}) / (Z(\text{Hits}) + Z[(\text{False alarms})])$
46. Who proposed the global workspace theory of consciousness?
A) Baars
B) Chomsky
C) Putnam
D) None of the above
47. Superior colliculus is associated with
A) Olfaction
B) Eye movements
C) Speech
D) All of the above-mentioned

48. Which task is widely used to study attentional orienting?
- A) Double step task
 - B) Stop signal task
 - C) Posner's cueing task
 - D) Stroop task
49. Which ERP effect is traditionally linked with expectation violation?
- A) N400
 - B) P300
 - C) LRP
 - D) Both A and B.
50. Where are Purkinje cells found?
- A) Spinal cord
 - B) Cerebral cortex
 - C) Cerebellar cortex
 - D) All of the above
51. "Cocktail party effect" involves the mechanism of:
- A) Focussed auditory attention
 - B) Divided auditory attention
 - C) Change blindness
 - D) None of the above
52. What signifies inhibition of return (IOR) in a Posner cueing task?
- A) When response time on invalid trials is slower compared to valid trials
 - B) When response time on invalid trials is faster compared to valid trials
 - C) When response time is negative
 - D) When response time on invalid trials is equal to valid trials
53. The conduction of a nerve impulse down the axon is called a(n)
- A) ion potential.
 - B) action potential.
 - C) resting discharge.
 - D) synapse.
54. Who proposed the dual forms (reactive vs. Proactive) of cognitive control?
- A) Dodd
 - B) Braver
 - C) Dehaene
 - D) Tanenhaus

55. On a stop-signal task, a shorter SSRT refers to:
- A) greater inhibitory control
 - B) lesser inhibitory control
 - C) SSD does not measure inhibitory control
 - D) loss of inhibitory controlled
56. What is the average time taken to initiate a saccade in humans?
- A) About 0.02 s
 - B) About 0.2 s
 - C) Greater than 0.5 s
 - D) Greater than 1 s
57. Which of the following would be categorized as an incongruent trial in a colour-word stroop task?
- A) The word "RED" written in green ink
 - B) The word "APPLE" written in blue ink
 - C) The word "RED" written in blue ink
 - D) Both a and c
58. The visual world paradigm has been used to measure which of the following?
- A) Spoken word recognition
 - B) Translation activation in bilinguals
 - C) Predictive processing
 - D) All of the above
59. What is the name of the bundle of fibres that connect left and right hemispheres of the brain?
- A) Glial cells
 - B) Corpus callosum
 - C) Arbor vitae
 - D) Purkinje fibres
60. In the bilingualism literature, what does 'cognitive advantages of bilingualism' refer to?
- A) Bilinguals tend to perform better than monolinguals on certain tasks measuring inhibitory control etc.
 - B) Bilinguals tend to be more social than monolinguals
 - C) Bilinguals tend to be wealthier than monolinguals
 - D) Bilinguals like participating more in cognitive science experiments than monolinguals.
61. How many levels does the perceptual awareness scale (PAS) proposed by Ramsøy & Overgaard to measure subjective awareness of unconscious stimuli have?
- A) 2
 - B) 3
 - C) 4
 - D) 7

62. Continuous flash suppression (CFS) is based on which of the following phenomenon:
- A) Binocular rivalry
 - B) Parallel activation
 - C) Feature integration
 - D) Common coding
63. Who proposed the adaptive control hypothesis in bilingualism?
- A) Hartsuiker and Olivers
 - B) Huettig and Meyer
 - C) Kroll and Bialystok
 - D) Green and Abutalebi
64. In psycholinguistics, what does RHM stand for:
- A) Revised Hierarchical model
 - B) Recurrent hierarchical model
 - C) Revised habituated model
 - D) Recurrent habituated model
65. In eye movement research, microsaccades refer to:
- A) A small jerky movement
 - B) A smooth continuous movement
 - C) Movement to an optimal viewing position
 - D) A more or less stationary period
66. Who proposed the feedforward and recurrent processing model of visual processing?
- A) Benjamin Libet
 - B) Victor Lamme
 - C) Patrick Cavanaugh
 - D) Daniel Wegner
67. Which of the following is a major feature of Chomsky's nativist theory of language acquisition?
- A) Infants can distinguish all the sounds of the world's languages at birth.
 - B) Children learn words by associating sounds with contexts.
 - C) Innate mechanisms guide the selection of rules for learning any language.
 - D) There is a critical period for learning language in early childhood.
68. A large T is made out of small sized 'S' characters. Such a figure is used in:
- A) Visual world paradigm
 - B) Joint Simon task
 - C) Navon paradigm
 - D) Flanker task

69. The Attention network task (ANT) measures the following attention networks:

- A) Alerting
- B) Orienting
- C) Both
- D) Neither

70. The conflict effect on a stroop with congruent and incongruent trials is measured as:

- A) Incongruent RT – Congruent RT
- B) Incongruent RT/Congruent RT
- C) Incongruent RT/(Incongruent RT + Congruent RT)
- D) None of the above

71. “Attention is necessary and sufficient for eye movements”. This statement is

- A) True
- B) False
- C) It is debatable
- D) There is no empirical research on this.

72. Who proposed the “Unity in Diversity” model of executive functions

- A) Miyake
- B) Braver
- C) Haggard
- D) Hommel

73. Sense of agency refers to:

- A) ability to understand others' intentions and actions
- B) subjective awareness of initiating, executing, and controlling one's own volitional actions in the world.
- C) the sensation and perceptions resulting out of others' actions
- D) None of the above

74. Which region of the brain is specialised in facial recognition?

- A) Fusiform area
- B) hippocampus
- C) superior colliculus
- D) ACC

75. The Load theory of selective attention was proposed by whom?

- A) Anne Triesman
- B) Nilli Lavie
- C) Donald Broadbent
- D) Stanislas Dehaene

76. In functional magnetic resonance imaging, what does BOLD stand for?
- A) Blood oxygenated label description
 - B) Blood onset list description
 - C) Blood oxygenation level dependent
 - D) Blood onset level dependent
77. The electrical activity in the motor cortex just before the initiation of a voluntary movement is commonly called as:
- A) Movement potential
 - B) Onset potential
 - C) Initiation potential
 - D) Readiness potential
78. According to the dual stream model of visual processing proposed by Goodale and Milner, which stream(s) is/are responsible for guidance of actions, such as, reaching for an object?
- A) Ventral stream
 - B) Dorsal stream
 - C) Both of the above
 - D) None of the above
79. In a standard Posner cueing task, which of the following is most commonly observed at long cue-target SOAs?
- A) $RT \text{ on valid trials} = 2 * RT \text{ on invalid trials}$
 - B) $RT \text{ on valid trials} > RT \text{ on invalid trials}$
 - C) $RT \text{ on valid trials} = RT \text{ on invalid trials}$
 - D) None of the above
80. Some measures of brain function reveal what brain region is necessary (causal) for a mental ability, and other brain measures reveal what brain region is associated (correlated) with a mental ability. Which answer below contains only causal measures?
- A) lesions and functional magnetic resonance imaging (fMRI)
 - B) fMRI and transcranial magnetic stimulation (TMS)
 - C) lesions and TMS
 - D) fMRI and diffusion tensor imaging (DTI)